AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF	PAGES
	1		4

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	11 AUG 2003		

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
US ARMY ENGINEER DISTRICT, FORT WORTH ATTN: CESWF-CT (RM 2A19) PO BOX 17300 FORT WORTH, TX 76102-0300			

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*	(X)	9A. AMENDMENT OF SOLICIATION NO.
	☒	DACA63-03-B-0002
		9B. DATED *(SEE ITEM 11)* 14 JULY 2003
	☐	10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED *(SEE ITEM 11)*
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☒ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a)By completing items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (*Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

The Solicitation for Fixed Wing Aircraft Park, Phase II, Fort Hood, Texas, is amended as follows:

See Continuation Sheet:

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	16C. DATE SIGNED

Item 14. Continued.

CHANGE TO BID OPENING DATE

1. Standard Form 1442, First Page, Item No. 13.A.- In the second line, change the bid opening date from "14 August 2003, 2 p.m." to **"21 August 2003, 2 p.m.".**

CHANGES TO BIDDING SCHEDULE

2. Replace the Bidding Schedule, pages 00010-3 thru 00010-6, with the accompanying new Bidding Schedule, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002."

CHANGES TO THE SPECIFICATIONS

3. Write-in change to section 15700A, page 8, paragraph 2.5 – Change paragraph title from "UNITARY EQUIPMENT, TYPE II (C-RTU-1)" to **"UNITARY EQUIPMENT, TYPE II (A-RTU-1)".**

4. New Sections - Add the following accompanying new sections, each bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002," and add to the Table of Contents:

SECTION 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE
SECTION 02051 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS
SECTION 02090 LEAD-BASED PAINT (LBP) ABATEMENT AND DISPOSAL
SECTION 02115 HYDRANT FUELING SYSTEM REMOVAL
SECTION 02364 TERMITICIDE TREATMENT MEASURES FOR SUBTERRANEAN TERMITE CONTROL
SECTION 03330 CAST-IN-PLACE ARCHITECTURAL CONCRETE
SECTION 03370 CONCRETE FLOOR HARDENER
SECTION 04735 CAST STONE
SECTION 08120 ALUMINUM DOORS AND FRAMES
SECTION 08210 WOOD DOORS

5. Replacement Sections - Replace the following sections with the accompanying new sections of the same number and title, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002:"

SECTION 01000 CONSTRUCTION SCHEDULE
SECTION 02220 DEMOLITION
SECTION 02222 AIRFIELD PAVEMENT REMOVALS
SECTION 02466 DRILLED FOUNDATION CAISSONS (PIERS)
SECTION 07240 EXTERIOR INSULATION AND FINISH SYSTEMS
SECTION 08700 BUILDERS' HARDWARE
SECTION 13110A CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)
SECTION 13280A ASBESTOS ABATEMENT

CHANGES TO THE DRAWINGS

6. Replacement Drawings.- Replace the drawings listed below with the attached new drawings of the same number, bearing the notation "AM #0001":

G-004FHD.cal	4 of 9	G-004	INDEX OF DRAWINGS (CONTINUED)
G-005FHD.cal	5 of 9	G-005	"GENERAL NOTES, SYMBOLS & MOUNTING HEIGHTS"
G-006FHD.cal	6 of 9	G-006	GENERAL BUILDING AND ROOM SIGNAGE
G-007FHD.cal	7 of 9	G-007	"REGULATED MATERIAL SURVEY LOCATIONS AND QUANTITIES. - 90071, 90079 AND 90080"
G-008FHD.cal	8 of 9	G-008	REGULATED MATERIAL SURVEY LOCATIONS AND QUANTITIES. - BLDG. NO 90050
G-009FHD.cal	9 of 9	G-009	"REGULATED MATERIAL SURVEY LOCATIONS AND QUANTITIES. - BLDG. NO. 90049, CONTROL TOWER AND OPS. BUILDING"

c504.cal	4 of 124	C-504	PAVEMENT DETAILS
c505.cal	5 of 124	C-505	PAVEMENT DETAILS
ca104utl.cal	33 of 124	CA104	"WATER/GAS/FIRE UTILITIES, DEPLOYMENT CENTER"
ca105utl.cal	34 of 124	CA105	"SANITARY SEWER, DEPLOYMENT CENTER"
cc101dem.cal	39 of 124	CC101	"DEMOLITION PLAN, BASE OPERATIONS BUILDING"
cc104utl.cal	42 of 124	CC104	"WATER/GAS/FIRE UTILITIES, BASE OPERATIONS BUILDING"
cc105utl.cal	43 of 124	CC105	"SANITARY SEWER, BASE OPERATIONS BUILDING"
cd119lht.cal	65 of 124	CD119	"LIGHTING PLAN, TAXIWAY B"
cd120lht.cal	66 of 124	CD120	"LIGHTING PLAN, TAXIWAY B"
cd121lht.cal	67 of 124	CD121	"LIGHTING PLAN, TAXIWAY B"
cd122lht.cal	68 of 124	CD122	"LIGHTING PLAN, TAXIWAY B"
cd123lht.cal	69 of 124	CD123	"LIGHTING PLAN, TAXIWAY C"
cd124lht.cal	70 of 124	CD124	"LIGHTING PLAN, TAXIWAY A, B AND EXISTING RUNWAY"
cd125lht.cal	71 of 124	CD125	"LIGHTING PLAN, TAXIWAY A AND C"
cd126lht.cal	72 of 124	CD126	"LIGHTING PLAN, TAXIWAY A, C AND EXISTING RUNWAY"
cd127lht.cal	73 of 124	CD127	"LIGHTING PLAN, TAXIWAY A AND EXISTING RUNWAY"
ch103ste.cal	107 of 124	CH103	"SITE PLAN, AIRCRAFT PARKING APRON"
ch104ste.cal	108 of 124	CH104	"SITE PLAN, AIRCRAFT PARKING APRON"
ch105grd.cal	109 of 124	CH105	"GRADING PLAN, AIRCRAFT PARKING APRON"
ch106grd.cal	110 of 124	CH106	"GRADING PLAN, AIRCRAFT PARKING APRON"
ch109jnt.cal	113 of 124	CH109	"JOINT LAYOUT PLAN, AIRCRAFT PARKING APRON"
ch110jnt.cal	114 of 124	CH110	"JOINT LAYOUT PLAN, AIRCRAFT PARKING APRON"
cj101dem.cal	122 of 124	CJ101	"DEMOLITION PLAN, ROTARY WING APRON"
AA106dp1.cal	6 of 120	AA106	DEPLOYMENT FACILITY FLOOR PLAN - MANIFEST AREA
AA107dp1.cal	7 of 120	AA107	DEPLOYMENT FACILITY FLOOR PLAN - TROOP AREA 'B'
AA109dp1.cal	9 of 120	AA109	DEPLOYMENT FACILITY LIFE SAFETY PLAN - TROOP AREA 'A'
AA304dpl.cal	30 of 120	AA304	DEPLOYMENT FACILITY WALL SECTIONS
AA305dpl.cal	31 of 120	AA305	DEPLOYMENT FACILITY WALL SECTIONS
AA306dpl.cal	32 of 120	AA306	DEPLOYMENT FACILITY WALL SECTIONS
AA307dpl.cal	33 of 120	AA307	DEPLOYMENT FACILITY WALL SECTIONS
AA310dpl.cal	36 of 120	AA310	DEPLOYMENT FACILITY WALL SECTIONS
AA502dpl.cal	42 of 120	AA502	DEPLOYMENT FACILITY PLAN DETAILS
AA504dpl.cal	44 of 120	AA504	DEPLOYMENT FACILITY PLAN DETAILS
AA530dpl.cal	53 of 120	AA530	DEPLOYMENT FACILITY DOOR AND WINDOW DETAILS
AA601dpl.cal	60 of 120	AA601	DEPLOYMENT FACILITY DOOR SCHEDULE
AA604dpl.cal	63 of 120	AA604	DEPLOYMENT FACILITY ROOM FINISH PLANS
AB101whs.cal	72 of 120	AB101	PALLET WAREHOUSE FLOOR PLAN
AB301whs.cal	78 of 120	AB301	PALLET WAREHOUSE WALL SECTIONS
AB510whs.cal	81 of 120	AB510	PALLET WAREHOUSE PLAN AND SECTION DETAILS
AB511whs.cal	82 of 120	AB511	PALLET WAREHOUSE SECTION DETAILS
AB531whs.cal	86 of 120	AB531	PALLET WAREHOUSE WINDOW DETAILS
AB540whs.cal	87 of 120	AB540	PALLET WAREHOUSE STAIR AND RAILING DETAILS
AC301bop.cal	99 of 120	AC301	BASE OPERATIONS FACILITY WALL SECTIONS
AC302bop.cal	100 of 120	AC302	BASE OPERATIONS FACILITY BUILDING SECTIONS
AC601bop.cal	113 of 120	AC601	"BASE OPERATIONS FACILITY DR, WDW & RM FIN SCHEDULES"
AC612bop.cal	117 of 120	AC612	BASE OPERATIONS FACILITY PARTITION TYPES
MA401dp1.cal	16 of 46	MA401	"DEPLOYMENT FACILITY TROOP AREA ""B"" ENLARGED MECHANICAL YARD PLAN"
MA503dp1.cal	19 of 46	MA503	DEPLOYMENT FACILITY MECHANICAL DETAILS
e007.cal	7 OF 65	E-007	ELECTRICAL DETAILS
ea101dpx.cal	11 OF 65	EA101	DEPLOYMENT FACILITY ELECTRICAL SITE PLAN
ea107dp1.cal	17 OF 65	EA107	"DEPLOYMENT FACILITY TROOP AREA ""B"" POWER PLAN"
ea601dpx.cal	26 OF 65	EA601	DEPLOYMENT FACILITY PANELBOARD SCHEDULES
eb101whs.cal	28 OF 65	EB101	PALLET WAREHOUSE ELECTRICAL SITE PLAN
ec101bop.cal	36 OF 65	EC101	BASE OPERATIONS BUILDING ELECTRICAL SITE PLAN
EX001.cal		EX001	APPROACH LIGHTING ELECTRICAL KEY PLAN
EX002.cal		EX002	EXTERIOR LEGEND & SCHEDULES
EX101.cal		EX101	ELECTRICAL DEMOLITION PLAN AREA 1
EX102.cal		EX102	ELECTRICAL DEMOLITION PLAN AREA 2

EX103.cal	EX103ELECTRICAL DEMOLITION PLAN AREA 3
EX104.cal	EX104ELECTRICAL DEMOLITION PLAN AREA 11
EX105.cal	EX105ELECTRICAL DEMOLITION PLAN AREA 12
EX106.cal	EX106ELECTRICAL SITE PLAN AREAS 1 & 1A
EX107.cal	EX107ELECTRICAL SITE PLAN AREA 2
EX108.cal	EX108ELECTRICAL SITE PLAN AREA 3
EX109.cal	EX109ELECTRICAL SITE PLAN AREA 4
EX110.cal	EX110ELECTRICAL SITE PLAN AREA 10
EX111.cal	EX111ELECTRICAL SITE PLAN AREA 11
EX112.cal	EX112ELECTRICAL SITE PLAN AREA 12
EX113.cal	EX113ELECTRICAL SITE PLAN AREA 13
EX114.cal	EX114ELECTRICAL SITE PLAN AREA 17
EX115.cal	EX115ELECTRICAL SITE PLAN AREA 18
EX116.cal	EX116ELECTRICAL SITE PLAN AREA 19
EX117.cal	EX117ELECTRICAL SITE PLAN AREA 20
EX118.cal	EX118ELECTRICAL SITE PLAN AREA 21
EX119.cal	EX119ELECTRICAL SITE PLAN AREA 22
EX120.cal	EX120ELECTRICAL SITE PLAN AREA 23
EX201.cal	EX201NORTH AND SOUTH APPROACH LIGHTING PROFILES
EX401.cal	EX401LIGHTING VAULT EQUIPMENT PLAN
EX501.cal	EX501"MANHOLE, HANDHOLE AND TRANSFORMER DETAILS"
EX502.cal	EX502THRESHOLD & APPROACH LIGHTING DETAILS
EX503.cal	EX503PAVEMENT REPLACEMENT DETAILS FOR AIRFIELD LIGHTING
EX504.cal	EX504APPROACH LIGHTING DETAILS 2
EX505.cal	EX505APPROACH LIGHTING DETAILS 3
EX506.cal	EX506APPROACH LIGHTING DETAILS 4
EX507.cal	EX507APPROACH LIGHTING DETAILS 5
EX508.cal	EX508SEQUENCE FLASHER STATION DETAILS
EX601.cal	EX601RUNWAY & APPROACH LIGHTING WIRING DIAGRAM 1
EX602.cal	EX602RUNWAY & APPROACH LIGHTING WIRING DIAGRAM 2
EX603.cal	EX603LIGHTING VAULT POWER RISER DIAGRAM
EX604.cal	EX604AIRFIELD LIGHTING CIRCUIT & DUCT RUN SCHEDULES

END OF AMENDMENT

ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002
Fixed Wing Aircraft Parking Apron, Phase II (Title)
Fort Hood, Texas (Location)

Solicitation No.DACA63-03-B-0002

BIDDING SCHEDULE
(To be attached to SF 1442)

BASE BID: All work required by the plans and specifications exclusive of work required by Option Bid Items.

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
0001	Deployment Facility; complete, including utilities to the 1524mm (5-ft) line, and exclusive of all other work listed separately.	Job	Sum	***	$_____
0002	Pallet Warehouse complete, including utilities to the 1524mm (5-ft) line, and exclusive of all other work listed separately.	Job	Sum	***	$_____
0003	Base Operations Building complete, including utilities to the 1524mm (5-ft) line, and exclusive of all other work listed separately.	Job	Sum	***	$_____
0004	Drilled Piers				
0004AA	460mm (18-In) Drilled Piers	1,733	LF	$_____	$_____
0004AB	460mm (18-In) Casing	578	LF	$_____	$_____
0004AC	610mm (24-In) Drilled Piers	136	LF	$_____	$_____
0004AD	610mm (24-In) Casings	45	LF	$_____	$_____
0004AG	762mm (30-In) Drilled Piers	68	LF	$_____	$_____
0004AH	762mm (30-In) Casings	23	LF	$_____	$_____
(Am#1)	**0004AJ**	**914mm (36-In) Drilled Piers**	**120**	**LF**	**$_____**	**$_____**
(Am#1)	**0004AK**	**914mm (36-In) Casings**	**40**	**LF**	**$_____**	**$_____**
0005	Aircraft Parking Apron	Job	Sum	***	$_____
0006	Ammo Upload Road	Job	Sum	***	$_____
0007	Runway Approach Lighting	Job	Sum	***	$_____
0008	Taxiway Rehabilitation	Job	Sum	***	$_____
0009	Rotary Wing Helicopter Apron	Job	Sum	***	$_____
0010	HTRW Abatement	Job	Sum	***	$_____
0011	Airfield Signage & Lighting	Job	Sum	***	$_____

ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002
Fixed Wing Aircraft Parking Apron, Phase II (Title)
Fort Hood, Texas (Location)

Solicitation No.DACA63-03-B-0002

BIDDING SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
0012	Construct all Exterior (Including utilities, earthwork, paving, sidewalk, curb and gutter, screen walls, demolition and landscaping and all work listed separately)	Job	Sum	***	$_____
0013	Final As-Built Drawings	Job	Sum	***	$100,000.00
0014	Operation and Maintenance Manuals	Job	Sum	***	$ 27,000.00
0015	Mobilization and Demobilization	Job	Sum	***	$_____
0016	Warranty Work (All Contract Work) The monetary value of this bid item shall equal at least 1 per cent of the total of all bid items preceding it. A value less than 1 per cent will result in a determination of non-responsive bid. See Contract Specification Section 01770F CONTRACT CLOSEOUT, paragraph “Contractor’s Response to Construction Warranty Service Requirements.”	Job	Sum	***	$_____

TOTAL BASE BID $_____

0017 OPTION NO. 1: Additional cost for all work required by the plans and specifications for the Airfield Parking Apron M.O.G. 7

Job Sum *** $_____

TOTAL OPTION NO. 1 $_____

TOTAL BASE BID PLUS OPTION No. 1 $_____

ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-03-B-0002
Fixed Wing Aircraft Parking Apron, Phase II (Title)
Fort Hood, Texas (Location)

Solicitation No.DACA63-03-B-0002

BIDDING SCHEDULE

NOTES:

1. ARITHMETIC DISCREPANCIES (EFARS 14.407-2)

(a) For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the bidding schedule as submitted by bidders:

(1) Obviously misplaced decimal points will be corrected;

(2) In case of discrepancy between unit price and extended price, the unit price will govern;

(3) Apparent errors in extension of unit prices will be corrected; and

(4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the Government will proceed on the assumption that the bidder intends his bid to be evaluated on the basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

2. If a modification to a bid based on unit prices is submitted, which provides for a lump sum adjustment to the total estimated cost, the application of the lump sum adjustment to each unit price in the bid schedule must be stated. If it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a pro rata basis to every unit price in the bid schedule.

3. Bidders must bid on all items.

4. Costs attributable to Division 01 - General Requirements are assumed to be prorated among bid items listed.

5. Responders are advised that this requirement may be delayed, cancelled or revised at any time during the solicitation, selection, evaluation, negotiation and/or final award process based on decisions related to DOD changes in force structure and disposition of the Armed Forces.

BIDDING SCHEDULE

NOTES: (cont)

6. For the purpose of this solicitation, the word "item" shall be considered to mean "schedule" as used in Provision 52.214-0019, CONTRACT AWARD--SEALED BIDDING--CONSTRUCTION, in Section 00100 INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS.

7. EXERCISE OF OPTIONS (SWDR 715-1-1 (16 January 1996))

The Government reserves the right to exercise the option(s) by written notice to the Contractor either singularly or in any combination for up to 90 calendar days after award of the Base Bid without an increase in the Offeror's Bid Price. Completion of added items shall continue at the same schedule as the Base Bid unless otherwise noted in Section 01000 CONSTRUCTION SCHEDULE, paragraph 1 entitled SCHEDULE.

8. ABBREVIATIONS

For the purpose of this solicitation, the units of measure are represented as follows:

a. EA (each)
b. GAL (gallons)
c. CF (cubic feet)
d. SF (square feet)
e. LF (linear feet)
f. LS (lump sum)
g. MM (millimeters)
h. LM (length in linear meters)

END OF BIDDING SCHEDULE

SECTION 01000

CONSTRUCTION SCHEDULE
AM #0001

PART 1 GENERAL

1.1 Schedule
Commence, prosecute, and complete the work under this Contract in accordance with the following schedule and Section 00800 SPECIAL CONTRACT REQUIREMENT clauses COMMENCEMENT, PROSECURTION AND COMPLETION OF WORK and LIQUIDATED DAMAGES:

Item of Work	Commencement Of Work (calendar days)	Completion Of work (calendar days)	Liquidated Damages per calendar day[1]
(1) Deployment Center & Pallet Warehouse and All Associated Site Utilities & Site Work	Within 10 days After Receipt of Notice to Proceed	540 days	$1,000.00
(2) Taxiways B and C & Associated Airfield Lighting & Site Work **[AM #0001]**	Within 10 days After Receipt of Notice to Proceed	**[AM #0001]** **150** days	$1,000.00
(3) Ammo Upload Road & Associated Work **[AM #0001]**	Within 10 days After Receipt of Notice to Proceed	**[AM #0001]** **300** days	$ 500.00
(4) Aircraft Parking Apron Associated Hydrants,Fuel Lines, Control, etc. West of the Demarcation Line	Within 10 days After Receipt of Notice to Proceed	**[AM #0001]** **450** days	$ 500.00
(5) Base Operations Building and Associated Site Utilities & Site Work to include demolition of Bldg. #90050	60 Days after NTP	450 days	$1,000.00
(6) All Work Not Separately Listed	Within 10 days after N.T.P.	540 days	$ 200.00

Item of Work	Commencement Of Work (calendar days)	Completion Of work (calendar days)	Liquidated Damages per calendar day[1]
(7) Establishment of Turf	*	*	-----
(8) O&M Manuals	**	**	See Bidding Schedule's Withholding Amount
(9) Final As-Built Drawings	***	***	See Bidding Schedule's Withholding Amount
(10) Building # 90049 (Abatement & Demolition)	60 days after Completion of Base Operations Bldg	60 days	$ 500.00
(11) Aircraft Parking Apron Work Restricted Area (Area East of Demarcation Line**) [AM #0001]**	10 days after approval by Contracting Officer	Within 70 days of start& within 375 days of N.T.P.	$ 200.00
(12) Work Restricted Areas of **[AM #0001] Taxiways B & C**	10 days after Approval by Contracting Officer	60 days	$ 300.00
[AM #0001] (13) Helicopter Apron Repair & Striping (Sheet# CJ101, CJ102 and CK101)	**10 days after Notice to Proceed**	**120 days**	**$ 100.00**
[AM #0001] (14) Runway Approach Lighting	**450 days after Notice to Proceed**	**60 days**	**$ 200.00**

[1]Liquidated damages are not accumulative.

*Establishment of Turf

Planting and maintenance for turfing shall be in accordance with Section 02925 ESTABLISHMENT OF TURF. No payment will be made for establishment of turf until all requirements of the section are adequately performed and accepted, as determined by the Contracting Officer.

**6 Copies of approved O&M Manuals for each building shall be turned-in to the Government 60 days before completion of the respective Item of Work. See Section 01770 CONTRACT CLOSEOUT, paragraph OPERATION AND MAINTENANCE MANUALS.

***See Section 01770 CONTRACT CLOSEOUT, paragraph titled RECORD DRAWINGS.

1.1.1 Testing of Heating and Air-Conditioning Systems

The times stated for completion of this project includes all required testing specified in appropriate specification sections of heating, air conditioning and ventilation systems including HVAC Commissioning. Exception: boiler combustion efficiency test, boiler full load tests, cooling tower performance tests, and refrigeration equipment full load tests, when specified in the applicable specifications, shall be preformed in the appropriate heating/cooling season as determined by the Contracting Officer.

1.2 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (OCT 1989) (ER 415-1-15)(52.0001-4038 1/96)

a. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays due to precipitation and temperature is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities. Wind is not considered in the Monthly Anticipated Adverse Weather Calendar Day Schedule.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	4	4	4	6	4	3	3	4	4	3	4

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day.

The number of actual adverse weather delay days shall include days impacted

by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph "b", above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)."

1.3 CONSTRUCTION PHASING

1.3.1 Phasing Requirements

The Contractor will be working adjacent to and on active aircraft taxiways, runways, and support areas while Robert Gray Army Airfield is in operation of Military and Civilian aircraft. RGAAF is critical to the Army's mission and national security. The contractor shall take care not to interfere or detrimentally affect the operation of the airfield runway or other facilities. Airfield operations must be maintained at all times. Airfield operations cannot tolerate typical construction dust and flying debris. The contractor must include in his Demolition Plan and Environmental Protection Plan procedures with intensive control measures to minimize dust and ensure that flying debris is eliminated. The contractor shall anticipate short periodic delays as well as extended periods as noted below to accommodate airfield operations.

The Contractor shall comply with all airfield safety and operational requirements. While working adjacent to active taxiways and runways, the Contractor's foreman in charge of the workers shall have a radio and be in constant communications with the airfield tower. The Contractor-supplied hand-held radios shall be equal to model #M-RK I, 900 MHz Ericsson EDACS Portable Radio and shall be on Frequency (to be programmed by DOIM). The Contractor shall provide one additional operational radio for communications with the control tower for use by the Government's Quality Assurance Representative. The Contractor shall pay $32.00 per month per radio for Airtime for the length of the Contract or a total of $3000 for total airtime to the Fort Hood DOIM. The radios will be turned-in to the Government at the end of the Contract.

All workers shall wear reflectorized bright red/orange high-visibility safety vests when working adjacent to taxiways and runways.

A. Work Restricted Area (WRA):

Work within 150 feet of the centerline of an existing taxiway or within **[AM #0001] 150 feet** of the edge of existing runway is in a Work Restricted Area (WRA). Construction of new Aircraft Parking, **[AM #0001] B & C Taxiways,** Ammo Upload Road and Base Opns site work within 150 feet of a taxiway centerline or **[AM #0001] 150 feet** from closest runway edge is in a Work Restricted Area.

The contractor shall allow a minimum of 30 days prior notice for approval/disapproval of his proposed schedule to work in the various Work Restricted Areas (WRA). All aircraft will be diverted during the contractor's work in the WRA. Therefore, the duration of work in these areas must be minimized. The contractor must ensure the taxiway is safely accessible for the user's traffic throughout work in the WRA and or runway. In order to allow for deployment of ammunitions, the contractor should anticipate being required to stop work and evacuate the Ammo Upload Road

and Aircraft Parking WRA's for up to 3 each 48 hour-periods during scheduled work in these Work Restricted Areas.

(1) Construction in WRA's may be halted for periods of up to 15 minutes when aircraft are using the adjacent taxiway or runway. This should happen no more than 20 times a week on average.

(2) The Contractor shall erect a temporary 1 meter (3 feet) height chain-link fence along the 46 meters (150-foot) work restriction line at the south parking apron and at the taxiway adjacent to the runway**. [AM #0001]** This fence shall restrict personnel and equipment from entering the work restriction area. The fence shall be maintained from Contractor mobilization at the site until final inspection of the site. Additionally, the Contractor shall maintain lighted safety striped drums (18" dia x 3'-0") **[AM #0001] along the work restricted area line at 15' on center.**

(3) The Contractor shall schedule his construction within the work restriction area at **[AM #0001] Taxiways B & C** so that once he starts work in the area, he can complete the work within 60 days. Additionally, this work shall be completed **[AM #0001] 150** days after the Notice to Proceed. Liquidated Damages for this Item of Work **[AM #0001] shall be as shown in paragraph 1.1 Schedule**.

(4) The Contractor shall schedule his construction within the work restriction area at the Aircraft Parking Area so that once he starts work in the Aircraft Parking Area, he can complete the work within 70 days. Additionally, this work shall be completed **[AM #0001] 450** days after the Notice to Proceed. Liquidated Damages for this Item of Work shall be **[AM #0001] as shown in paragraph 1.1 Schedule**.

(5) The Contractor shall schedule his construction within the work restriction area at the Ammo Upload Road Area so that once he starts work in this Area, he can complete the work within 90 days. Additionally, this work shall be completed **[AM #0001] 300** days after the Notice to Proceed. Liquidated Damages for this Item of Work shall be **[AM #0001] $500.00** per calendar day.

B. Airfield Approach Lighting:

(1) The existing approach lighting shall not be removed or made inoperative until the new approach lighting is operational.

(2) The erection of the metal centerline light bars and flashers shall not commence until all foundations, electrical handholes, conducts, ducts, conductors, etc., are completed and ready for final erection of light standards. Final erection of FAA type metal light structures shall be completed at one end of the runway and shall be operational and accepted by the Government before work on the other end shall start. The Contractor shall complete the installation and testing of the FAA approved light structures within 10 days after starting at either end. Airfield approach lighting at the north end of the runway shall commence before the south end.

C. Taxiway and Runway Lighting and Signage:

(1) Existing taxiway, runway and airfield signage lighting shall not be removed or made inoperative until the new lighting is operational or a transfer from the old lighting to the new is ready for a 1-hour transfer. Construction of the Taxiway Lights shall not begin until all materials for the work are approved and on-site. The Contractor shall inventory all the

equipment and report the results of the inventory to the Q.A. The Contactor shall notify the Government 30 days before his scheduled start of this work.

(2) Contractor's construction and operations near the taxiways and runways will be restricted and limited to times when the airfield is not conducting aircraft landings, take-offs or operations on taxiways. The Contractor shall anticipate construction delays lasting 15 minutes or more several times a day.

D. Fire Alarm and Fire Sprinkler System:

The Contractor shall submit the fire alarm and fire sprinkler transmittals such that they are approved within 180 days after the notice to proceed. The fire alarm and fire sprinkler systems shall be tested per specification and completely operational **[AM #0001] 60** days before the Final Inspection. Only 50% payment for all activities related to the fire alarm and fire sprinkler systems will be allowed prior to all contract requirements to include the final acceptance testing is successfully completed and the system is approved and accepted by the Contracting Officer.

1.4 WORK RESTRICTIONS

1.4.1 Working Hours

Normal working hours shall be Monday through Friday, 0700 to 1700 hours.

1.4.2 Security Requirements

For the duration of this Contract, access to Fort Hood will be delayed between 5 minutes to 30 minutes or more due to increased security precautions, including the checking of vehicle occupants' identification, vehicle manifests, and the searching of all vehicles. Any general or specific threat to the safety of those working or living at Fort Hood could result in longer waiting times at the access points to Fort Hood.

The following are requirements for contractor employees entering Fort Hood:

a. One form of picture ID.

b. A memo from the construction company on their letterhead stating the reason for entry, contract number, and the location at Fort Hood where the jobsite is located.

c. All delivery trucks must have a bill of laden and delivery truck drivers must have a picture ID.

d. Employee Identification Badges: Contractor personnel shall wear visible Contractor-furnished employee identification badges while physically on the Installation. Each badge shall include, as a minimum, the company name, employee name, photograph, Contract Title, Contract Number, and the expiration date of the badge. See Section 01500 TEMPORARY CONSTRUCTION FACILITIES for additional requirements.

1.5 UTILITIES

1.5.1 Payment for Utility Services

Water, gas, and electricity are available from Government-owned and operated systems and will be charged to the Contractor at rates as provided in Contract Clause 52.236.14 AVAILABILITY AND USE OF UTILITY SERVICES.

1.5.1.1 Meters and Temporary Connections

The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall provide and maintain necessary temporary connections, distribution lines, and meter bases required to measure the amount of each utility used for the purpose of determining charges. The Contractor shall notify the Contracting Officer, in writing, 5 working days before utility (gas,water,electricity) connections are desired so that a utilities contract can be established.

1.5.1.2 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, the Contractor shall notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. The Contractor shall then remove all the temporary distribution lines, meter bases, and associated paraphernalia. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.

1.5.2 Outages

The Contractor shall coordinate all requests for utility outages with the Contracting Officer in writing 14 days prior to date of requested outages:

a. Water and sewer outages shall be held to a maximum duration of 2 hours unless otherwise approved in writing.

b. All utility outages shall be scheduled only on Saturdays, Sundays, or holidays unless specific approval is otherwise received.

c. Gas or electrical outages are prohibited. Connections to gas and electric lines shall be connected hot without an outage. The Contractor shall submit his work plan for electrical connections 14 days before requested connection

1.6 STREET CLOSINGS

The Contractor shall coordinate all requests for street closings with the Contracting Officer in writing 14 days prior to date of requested outage:

a. One lane traffic shall be maintained at all times (except that a total closing may be allowed for specified 8-hour periods).

b. The final street repair shall be completed within 14 days after the start of any street closing. Any part of the street returned to service prior to final repair shall be maintained smooth with hot-mix cold-lay surface course.

c. Open cuts across paved roads and streets for utility crossing will not be allowed. Utility crossing will be accomplished by boring or jacking procedures unless otherwise indicated.

1.7 PAYMENT FOR MOBILIZATION AND DEMOBILIZATION (DFAR 252.236-7004)(DEC 1991)

(a) The Government will pay all costs for the mobilization and demobilization of all of the Contractor's plant and equipment at the

contract lump sum price for this Item.

(1) 60 percent of the lump sum price upon completion of the Contractor's mobilization at the work site.

(2) The remaining 40 percent upon completion of demobilization.

(b) The Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid if the Contracting Officer believes that the percentages in paragraphs (a)(1) and (2) of this clause do not bear a reasonable relation to the cost of the work in this contract.

(1) Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of-

(i) Actual mobilization costs at completion of mobilization;

(ii) Actual demobilization costs at completion of demobilization; and

(iii) The remainder of this item in the final payment under this contract.

(2) The Contracting Officer's determination of the actual costs in paragraph (b)(1)of this clause is not subject to appeal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01351

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH Threshold Limits	(1998) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1	(1990) Emergency Eyewash and Shower Equipment

AMERICAN PETROLEUM INSTITUTE (API)

API Publ 2219	(1986) Safe Operation of Vacuum Trucks in Petroleum Service
API RP 1604	(1996) Closure Underground Petroleum Storage Tanks
API Std 2015	(1994) Safe Entry and Cleaning of Petroleum Storage Tanks

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115	(1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.2 DESCRIPTION OF WORK

This section provides additional safety and health requirements for the accident prevention provisions of EM 385-1-1, which specifies a Site Safety and Health Plan (SSHP) that shall satisfy the requirements for submission and acceptance as required by EM 385-1-1. These requirements shall apply to work performed in both "contaminated" and "clean" areas.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Work Zones; FIO.

Drawings shall include initial work zone boundaries: Exclusion Zone (EZ), including restricted and regulated areas; Contamination Reduction Zone (CRZ); and Support Zone (SZ).

Decontamination Facilities; FIO.

Drawings shall show the layout of the personnel and equipment decontamination areas.

SD-09 Reports

Monitoring/Sampling Results; FIO.

SD-13 Certificates

Safety and Health for Hazardous Waste Sites; GA.

Certificates of training in accordance with 29 CFR 1910.120 from all workers involved in this project.

Personnel exposure monitoring/sampling results.

Site Control Log; FIO.

Record of each entry and exit into the site, as specified.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with EM 385-1-1, applicable Federal, state, and local safety and occupational health laws and regulations. This includes, but is not limited to, Occupational Safety and Health Administration (OSHA) standards, 29 CFR 1910, especially Section .120, "Hazardous Waste Site Operations and Emergency Response" and 29 CFR 1926, especially Section .65, "Hazardous Waste Site Operations and Emergency Response". Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 PRECONSTRUCTION SAFETY CONFERENCE

See below paragraph ACCEPTANCE OR MODIFICATIONS.

1.6 SAFETY AND HEALTH PROGRAM

OSHA Standards 29 CFR 1910, Section .120 (b) and 29 CFR 1926, Section .65 (b) require employers to develop and implement a written Safety and Health Program for employees involved in hazardous waste operations. The site-specific program requirements of the OSHA Standards shall be integrated into one site-specific document, the Site Safety and Health Plan (SSHP). The SSHP shall interface with the employer's overall Safety and Health Program. Any portions of the overall Safety and Health Program that are referenced in the SSHP shall be included as appendices to the SSHP.

1.7 SITE SAFETY AND HEALTH PLAN

1.7.1 Preparation and Implementation

A Site Safety and Health Plan (SSHP) shall be prepared covering onsite work to be performed by the Contractor and all subcontractors. The Safety and Health Manager shall be responsible for the development, implementation and oversight of the SSHP. The SSHP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The SSHP shall address site-specific safety and health requirements and procedures based upon site-specific conditions. The level of detail provided in the SSHP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial SSHP is prepared and submitted. Therefore, the SSHP shall address, in as much detail as possible, anticipated tasks, their related hazards and anticipated control measures. Additional details shall be included in the activity hazard analyses as described in paragraph ACTIVITY HAZARD ANALYSES.

1.7.2 Acceptance and Modifications

Prior to submittal, the SSHP shall be signed and dated by the Safety and

Health Manager and the Site Superintendent. The SSHP shall be submitted for review 21 working days prior to the Preconstruction Conference. Deficiencies in the SSHP will be discussed at the preconstruction safety conference, and the SSHP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written SSHP shall be maintained onsite. As work proceeds, the SSHP shall be adapted to new situations and new conditions. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted SSHP shall be cause for stopping of work until the matter has been rectified.

1.7.3 Availability

The SSHP shall be made available in accordance with 29 CFR 1910, Section .120 (b)(1)(v) and 29 CFR 1926, Section .65 (b)(1)(v).

1.7.4 Elements

Topics required by 29 CFR 1910, Section .120 (b)(4) 29 CFR 1926, Section .65 (b)(4) and the Accident Prevention Plan as described in Appendix A of EM 385-1-1 and those described in this section shall be addressed in the SSHP. Where the use of a specific topic is not applicable to the project, the SSHP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic.

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.8.1 Project/Site Conditions

The following information is a record of site contaminants and a description of the site. This information is provided to assist in preparing the SSHP.

1.8.1.1 Site Information

The hydrant fueling sytem (see Section 02115 - HYDRANT FUELING SYSTEM REMOVAL) addressed by this project have been confirmed as having contained JP-8 fuel.

1.8.1.2 List of Available Documents

Further information is available from Section 01450 - CHEMICAL DATA QUALITY CONTROL.

1.8.2 Plan Requirements

The SSHP shall include a site description and contamination characterization section that addresses the following elements:

a. Description of site location, topography, size and uses of the site.

b. A list of contaminants which may present occupational health and safety hazards. This list shall be created by evaluating the analytical results from sampling and testing in Section 01450 - CHEMICAL DATA QUALITY CONTROL. Chemical names, concentration ranges, media in which found, locations onsite, and estimated quantities/volumes to be impacted by site work shall be included if known. The contamination characterization shall be reviewed and revised if new chemicals are identified as work progresses.

1.8.3 Not Used

1.9 HAZARD/RISK ANALYSIS

The SSHP shall include a safety and health hazard/risk analysis for each site task and operation to be performed. The hazard/risk analysis shall provide information necessary for determining safety and health procedures, equipment, and training to protect onsite personnel, the environment (via storm runoff), and the public. Available site information shall be reviewed when preparing the "Hazard/Risk Analysis" section of the SSHP. The following elements, at a minimum, shall be addressed.

1.9.1 Site Tasks and Operations (Workplan)

The SSHP shall include a comprehensive section that addresses the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives. The Contractor shall develop a list of anticipated major site tasks and operations to be performed from description of work in Section 02115 - HYDRANT FUELING SYSTEM REMOVAL. This list of site tasks and operations shall be expanded and/or revised, after initial chemical analytical results are available or after site evaluation, as necessary.

1.9.2 Hazards

The following potential hazards and safety issues listed in paragraphs 1.18.6 through 1.18.20 may be encountered during site work. These are not complete lists; therefore, they shall be expanded and/or revised as necessary during preparation of the SSHP after site visit. The Contractor shall take into consideration of all potential hazards and safety issues of concern to develop the SSHP.

1.9.2.1 Safety Hazards

Potential safety hazards associated with excavation, trenching, backfilling, and stockpiling activities. The SSHP shall address exposure to safety hazards in accordance with EM 385-1-1

1.9.2.2 Chemical Hazards

Potential chemical hazards that may be encountered during site work are discussed in paragraph SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION. The Hazard/Risk Analysis section of the SSHP shall describe the chemical, physical, and toxicological properties of contaminants, sources and pathways of employee exposures, anticipated onsite and offsite exposure level potentials, and regulatory (including Federal, state, and local) or recommended protective exposure standards. The SSHP shall also address employee exposure to hazardous substances brought onsite, and shall comply with the requirements of 29 CFR 1910, Section .1200 and 29 CFR 1926, Section .59, Hazard Communication.

1.9.2.3 Physical Hazards

Potential physical hazards that are encountered suring site work are slip, trip and fall. The SSHP shall address exposure to safety hazards in accordance with EM 385-1-1.

1.9.2.4 Radiological Hazards

There is no known radiation hazard in this project.

1.9.2.5 Biological Hazards

Potential biological hazards are insects such as ants in hot weather.

1.9.3 Action Levels

1.9.3.1 General Requirements

Action levels shall be established for the situations listed below, at a minimum. The action levels and required actions (engineering controls, changes in PPE, etc.) shall be presented in the SSHP in both text and tabular form.

a. Implementation of engineering controls and work practices.

b. Upgrade or downgrade in level of personal protective equipment.

c. Work stoppage and/or emergency evacuation of onsite personnel.

d. Prevention and/or minimization of public exposures to hazards created by site activities.

1.9.3.2 Confined Space Entry

Entry into and work in a confined space will not be allowed when oxygen readings are less than 19.5% or greater than 23.5% or if the Lower Flammable Limit (LFL) reading is greater than 10%, unless these conditions are adequately addressed in the Permit Required Confined Space Program. In addition, action levels for toxic atmospheres shall be determined.

1.10 ACTIVITY HAZARD ANALYSES

Prior to beginning each major phase of work, an Activity Hazard Analysis shall be prepared by the Contractor performing that work and submitted for review and acceptance. The format shall be in accordance with EM 385-1-1, Section 1, Figure 1-1. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government onsite representatives. The activity hazard analyses shall be continuously reviewed and when appropriate modified to address changing site conditions or operations, with the concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Activity hazard analyses shall be attached to and become a part of the SSHP.

1.11 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

An organizational structure shall be developed that sets forth lines of authority (chain of command), responsibilities, and communication procedures concerning site safety, health, and emergency response. This organizational structure shall cover management, supervisors and employees of the Contractor and subcontractors. The structure shall include the means for coordinating and controlling work activities of subcontractors and suppliers. The SSHP shall include a description of this organizational structure as well as qualifications and responsibilities of each of the following individuals. The Contractor shall obtain Contracting Officer's acceptance before replacing any member of the Safety and Health Staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

1.11.1 Site Superintendent

A Site Superintendent, who has responsibility to implement the SSHP, the authority to direct work performed under this contract and verify compliance, shall be designated.

1.11.2 Safety and Health Manager

1.11.2.1 Qualifications

The services of an Industrial Hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals shall be utilized. The name, qualifications (education summary and documentation, ABIH or BCSP certificate), and work experience summary shall be included in the SSHP. The Safety and Health Manager shall have the following additional qualifications:

a. A minimum of 2 years experience in developing and implementing safety and health programs at underground storage tank removal projects.

b. Documented experience in supervising professional and technician level personnel.

c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.

d. Documented experience in the development of personal protective equipment programs, including programs for working in and around potentially toxic, flammable and combustible atmospheres and confined spaces.

e. Working knowledge of state and Federal occupational safety and health regulations.

1.11.2.2 Responsibilities

The Safety and Health Manager shall:

a. Be responsible for the development, implementation, oversight, and enforcement of the SSHP.

b. Sign and date the SSHP prior to submittal.

c. Conduct initial site-specific training.

d. Be present onsite during the first 2 days of activities and at the startup of each new major phase.

e. Visit the site as needed and at least once per month for the duration of activities, to audit the effectiveness of the SSHP.

f. Be available for emergencies.

g. Provide onsite consultation as needed to ensure the SSHP is fully implemented.

h. Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the Contracting Officer Representative (COR).

i. Provide continued support for upgrading/downgrading of the level of personal protection.

j. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

k. Review accident reports and results of daily inspections.

l. Serve as a member of the Contractor's quality control staff.

1.11.3 Site Safety and Health Officer (SSHO)

1.11.3.1 Qualifications of SSHO

An individual shall be designated the Site Safety and Health Officer

(SSHO). The name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer shall be included in the SSHP. The SSHO shall have the following qualifications:

a. A minimum of 2 years experience in implementing safety and health programs at underground storage tank removal projects where Level B personal protective equipment was required.

b. Documented experience in construction techniques and construction safety procedures.

c. Working knowledge of Federal and state occupational safety and health regulations.

d. Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments, and air sampling methods.

1.11.3.2 Responsibilities of SSHO

The Site Safety and Health Officer shall:

a. Assist and represent the Safety and Health Manager in onsite training and the onsite implementation and enforcement of the accepted SSHP.

b. Be assigned to the site on a full time basis for the duration of HTRW/UST work. The SSHO shall have no duties other than Safety and Health related duties. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer shall be present for each shift.

c. Have authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, monitoring for ionizing radiation, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log.

d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

e. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.

f. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.

g. Conduct accident investigations and prepare accident reports.

h. Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log.

i. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.11.4 Occupational Physician (OP)

1.11.4.1 Qualifications of OP

The services of a licensed physician, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible, shall be utilized. The physician shall be familiar with this site's hazards and the scope of this project. The medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities shall be included in the SSHP.

1.11.4.2 Responsibilities of OP

The physician shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910, Section .120 (f) and 29 CFR 1926, Section .65 (f) and paragraph MEDICAL SURVEILLANCE.

1.11.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but shall be immediately available to render first aid when needed.

1.11.6 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, shall perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They shall have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and shall report to and be under the supervision of the SSHO.

1.11.7 Not Used

1.11.8 Not Used

1.12 TRAINING

Personnel shall receive training in accordance with the Contractor's written safety and health training program and 29 CFR 1910 Section .120, 29 CFR 1926 Section .65, and 29 CFR 1926 Section .21. The SSHP shall include a section describing training requirements.

1.12.1 General Hazardous Waste Operations Training

Personnel entering the exclusion or contamination reduction zones shall have successfully completed 40 hours of hazardous waste instruction off the site; 3 days actual field experience under the direct supervision of a trained, experienced supervisor; and 8 hours refresher training annually. Onsite supervisors shall have completed the above training and 8 hours of additional, specialized training covering at least the following topics: the employer's safety and health program, personal protective equipment program, spill containment program, and health hazard monitoring procedures and techniques. Copies of current training certification statements shall be submitted prior to initial entry onto the work site.

1.12.2 Site-specific Training

Site-specific training sessions shall be documented in accordance with Section 01.B.03.b of EM 385-1-1.

1.12.2.1 Initial Session (Pre-entry Briefing)

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, shall attend a site-specific safety and health training session of at least 4 hours duration. This session shall be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1 shall be thoroughly discussed. The Contracting Officer shall be notified at least 5 days prior to the initial site-specific training session so government personnel involved in the project may attend.

1.12.2.2 Periodic Sessions

Periodic onsite training shall be conducted by the SSHO under the direction of the Safety and Health Manager at least weekly for personnel assigned to work at the site during the following week. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Should an operational change affecting onsite field work be made, a meeting prior to implementation of the change shall be convened to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and suppliers shall be conducted by the SSHO using the training curriculum outlines developed by the Safety and Health Manager.

1.12.2.3 Not Used

1.13 PERSONAL PROTECTIVE EQUIPMENT

1.13.1 PPE Program

In accordance with 29 CFR 1910 Section .120 (g)(5) and 29 CFR 1926 Section

.65 (g)(5), a written Personal Protective Equipment (PPE) program which addresses the elements listed in that regulation, and which complies with respiratory protection program requirements of 29 CFR 1910 Section .134, is to be included in the employer's Safety and Health Program. The Site Safety and Health Plan shall detail the minimum PPE ensembles (including respirators) and specific materials from which the PPE components are constructed for each site-specific task and operation to be performed, based upon the hazard/risk analysis. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH shall be used. Onsite personnel shall be provided with appropriate personal protective equipment. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the SSHP shall include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.13.2 Levels of Protection

The Safety and Health Manager shall establish appropriate levels of protection for each work activity based on review of site information, analytical data, an evaluation of the potential for exposure (inhalation, dermal, ingestion, and injection) during each task, initial air monitoring results, and a continuing safety and health monitoring program. The Safety and Health Manager shall also establish action levels for upgrade or downgrade in levels of PPE from the following specified minimum levels of protection. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE reassessment protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.13.2.1 Components of Levels of Protection

The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:

Level D.

1.13.2.2 Initial Minimum Levels of PPE by Task

The Contractor shall establish the initial minimum protective equipment requirements for each major task and operation in the format as detailed below. Available site information shall be reviewed and the list of tasks and operations and these levels of protection shall be expanded and/or revised during preparation of the SSHP, after analytical results are available, or after site evaluation.

MINIMUM PROTECTIVE EQUIPMENT REQUIREMENTS

TASK/OPERATION INITIAL LEVEL OF PROTECTION

1.13.3 PPE for Government Personnel

One clean set of personal protective equipment for work onsite and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and/or Contamination Reduction Zone, shall be available for use by the Contracting Officer or official visitors. The items shall be cleaned and maintained by the Contractor and stored in the clean room of the decontamination facility and clearly marked: "FOR USE BY GOVERNMENT ONLY." The Contractor shall provide basic training in the use and limitations of the PPE provided, and institute administrative controls to check prerequisites prior to issuance. Such prerequisites include meeting minimum training requirements for the work tasks to be performed and medical clearance for site hazards and respirator use.

1.14 MEDICAL SURVEILLANCE

The Safety and Health Manager, in conjunction with the Occupational Physician, shall detail, in the employer's Safety and Health Program and the SSHP, the medical surveillance program that includes scheduling of examinations, certification of fitness for duty, compliance with OSHA requirements, and information provided to the physician. Examinations shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place. Medical surveillance protocols and examination and test results shall be reviewed by the Occupational Physician. The medical surveillance program shall contain the requirements specified below. Personnel working in contaminated areas of the site shall have been examined as prescribed in 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65, and determined medically fit to perform their duties.

1.14.1 Frequency of Examinations

Employees shall have been provided with medical examinations as specified, within the past 12 months and shall receive exams annually thereafter (if contract duration exceeds 1 year); on termination of employment; reassignment in accordance with 29 CFR 1910 Section .120 (f)(3)(i), and 29 CFR 1926 Section .65 (f)(3)(i)(C); if the employee develops signs or symptoms of illness related to workplace exposures; if the physician determines examinations need to be conducted more often than once a year; and when an employee develops a lost time injury or illness during the period of this contract. The supervisor shall be provided with a written statement signed by the physician prior to allowing the employee to return to the work site after injury or illness resulting in a lost workday, as defined in 29 CFR 1904 Section .12 (f).

1.14.2 Content of Examinations

The following elements shall be included in the medical surveillance program. Additional elements may be included at the discretion of the occupational physician responsible for reviewing the medical surveillance protocols.

a. Complete medical and occupational history (initial exam only).

b. General physical examination of major organ systems.

c. Pulmonary function testing including FVC and FEV1.0.

d. CBC with differential.

e. Blood chemistry screening profile (e.g. SMAC 20/25).

f. Urinalysis with microscopic examination.

g. Audiometric testing (as required by Hearing Conservation Program).

h. Visual acuity.

i. Chest x-ray. (This test shall be performed no more frequently than every 4 years, unless directed by Occupational Physician.)

j. Electrocardiogram (as directed by Occupational Physician).

k. Urine heavy metals (arsenic, cadmium, chromium, and mercury).

l. serum lead.

m. zinc protoporphyrin.

1.14.3 Information Provided to the Occupational Physician

The physician shall be furnished with the following:

a. Site information from paragraph, SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION and info from Section 02115 - HYDRANT FUELING SYSTEM REMOVAL.

b. information on the employee's anticipated or measured exposure.

c. a description of any PPE used or to be used.

d. A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress).

e. A copy of 29 CFR 1910 Section .120, or 29 CFR 1926 Section .65.

f. Information from previous examinations not readily available to the examining physician.

g. A copy of Section 5.0 of NIOSH Pub No. 85-115.

h. Information required by 29 CFR 1910 Section .134.

1.14.4 Physician's Written Opinion

Before work begins a copy of the physician's written opinion for each employee shall be obtained and furnished to the Safety and Health Manager; and the employee. The opinion shall address the employee's ability to perform remediation work and shall contain the following:

a. The physician's recommended limitations upon the employee's assigned work and/or PPE usage.

b. The physician's opinion about increased risk to the employee's health resulting from work; and

c. A statement that the employee has been informed and advised about the results of the examination.

1.14.5 Medical Records

Documentation of medical exams shall be provided as part of the Certificate of Worker or Visitor Acknowledgment. Medical records shall be maintained in accordance with 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65.

1.15 NOT USED

1.15.1 [Enter Appropriate Subpart Title Here]

1.16 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

The Safety and Health Manager shall prepare and implement an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Available site information shall be reviewed and the exposure monitoring/air sampling program shall be expanded and/or revised for submittal as part of the SSHP.

1.17 HEAT AND COLD STRESS MONITORING

The Safety and Health Manager shall develop a heat stress and cold stress monitoring program for onsite activities. Details of the monitoring program, including schedules for work and rest, and physiological monitoring requirements, shall be described in the SSHP. Personnel shall be trained to recognize the symptoms of heat and cold stress. The SSHO and an alternate person shall be designated, in writing, to be responsible for the heat and cold stress monitoring program.

1.17.1 Heat Stress

Physiological monitoring shall commence when the ambient temperature is above 21.1 degrees C. Monitoring frequency shall increase as the ambient temperature increases or as slow recovery rates are observed. An adequate

supply of cool drinking water shall be provided for the workers. NIOSH Pub No. 85-115 may be consulted for guidance in determining protocols for prevention of heat stress.

1.17.2 Cold Stress

To guard against cold injury, appropriate clothing and warm shelter for rest periods shall be provided. Procedures to monitor and avoid cold stress shall be followed in accordance with the current TLVs for Cold Stress as recommended in ACGIH Threshold Limits.

1.18 SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

The SSHP shall describe the standard operating safety procedures, engineering controls and safe work practices to be implemented for the work covered. These shall include, but not be limited to, the following:

1.18.1 General Site Rules/Prohibitions

The plan shall discuss general site rules/prohibitions (buddy system, eating, drinking, and smoking restrictions, etc.)

1.18.2 Work Permit Requirements

The Contractor shall be responsible to obtain excavation, hot work, confined space permit (if entry is justified). Contaminated water in the hydrant fuel pits can be pumped off without entry. If entry is required, the Contractor shall justified work with Contracting Officer (see requirement in paragraph, Description of Work).

1.18.3 Material Handling Procedures

Soils and liquids.

1.18.3.1 Spill and Discharge Control

Written spill and discharge containment/control procedures shall be developed and implemented in accordance with approved Work Plan per Section 02115 - Hydrant Fueling System Removal (paragraph 1.6.2). These procedures shall address material handling equipment, and appropriate procedures for drum and container handling, opening, sampling, shipping and transport. These procedures shall describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g. booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials shall be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, and/or human health or the environment are threatened, the National Response Center, the state, and the Contracting Officer shall be notified as soon as possible. Reporting requirements shall be in accordance with Section 02115 - HYDRANT FUELING SYSTEM REMOVAL.

1.18.3.2 Materials Transfer Safety

Liquids and residues shall be removed from the fuel lines, hydrant fuel pits and valve boxes using explosion-proof or air-driven pumps. Pump motors and suction hoses shall be bonded to the metallic items being pumped and grounded to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the metallic items. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck shall be vapor free. The truck shall be located upwind from the metallic items being pumped and outside the path of probable vapor travel. The vacuum pump exhaust gases shall be discharged through a hose of adequate size and length downwind of the truck and metallic items being pumped. Vacuum truck operating and safety practices shall conform to API Publ 2219. Pumped residues shall be collected in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. After the materials have been transferred and the valve boxes, manholes or hydrant fuel pits have been exposed, fittings and lines leading to these units shall be disconnected and drained of their contents. The contents of the fuel pipes shall not spill to the environment during cutting or disconnecting of fittings. Materials drained shall be transferred into DOT-approved drums for storage and/or transportation. Only non-sparking or non-heat producing tools shall be used to disconnect and drain or to cut through fittings. Electrical equipment (e.g., pumps, portable hand tools, etc.) used for preparation of these mettalic items shall be explosion-proof.

1.18.4 Drum and Container Handling

Procedures and Precautions (opening, sampling, overpacking) shall be identified in the Work Plan per Section 02115.

1.18.5 Confined Space Entry Procedures

No confined space entry is known for this project, the Contractor shall verify onsite and discuss this issue with the COR during Preconstruction conference (see paragraph, Description of Work).

1.18.6 Hot Work

Hot work will not be permitted on or within the hydrant fueling system (pipes, pits, valve boxes) except as outlined herein. Prior to conducting hot work, a hot work permit shall be prepared and submitted. An example format for a hot work permit shall be included in the SSHP. The permit shall describe compliance with the following procedures. After interiors of mettalic items have been decontaminated, hot work may be conducted only when these items are inerted, and to the extent necessary to begin dismantling. After decontamination of interiors of metallic items, hot work shall not be performed unless monitoring indicates atmospheres within and immediately surrounding these metallic items are less than 8% oxygen inside the item and less than 10% of the LFL outside the item; continuous monitoring shall continue until the hot work is completed. The hot work prohibition includes welding, cutting, grinding, sawing, or other similar operations which could be expected to potentially generate combustion-producing temperatures or sparks, or which could produce

potentially hazardous fumes or vapors. An individual at each hot work site shall be designated as a fire watch. This person's sole responsibility shall be to monitor the hot work and have immediate access to the fire extinguisher located at each hot work site. A new permit shall be obtained at the start of each work shift during which hot work will be conducted.

1.18.7 Ignition Sources

1.18.8 Fire Protection and Prevention

1.18.9 Electrical Safety

1.18.10 Excavation, Shoring, and Trench Safety

1.18.11 Guarding of Machinery and Equipment

1.18.12 Lockout/Tagout

1.18.13 Fall Protection

1.18.14 Hazard Communication

1.18.15 Illumination

1.18.16 Sanitation

1.18.17 Engineering Controls

1.18.18 Process Safety Management

1.18.19 Signs and Labels

1.18.20 Waste Disposal

1.18.21 Purging for Permit-Required Confined Space Entries

Confined space entry into the pits shall not be attempted unless absolutely necessary. Confined space entry shall be concurred by both the COR and the Safety and Health Manager in written agreement. If confined space entry is attempted, the flammable vapors shall be reduce to less than 10% of the LFL and the oxygen content shall be between 19.5% and 23.5%. Flammable vapors may be exhausted from the metallic items by any of the methods from API RP 1604 listed below, or any method approved by the Contracting Officer. The SSHP shall specify the purging method to be used.

a. Ventilation by Eductor-Type Air Movers: The eductor-type air mover shall be properly bonded and grounded to prevent the generation and discharge of static electricity. When using this method, the fill (drop) tube shall remain in place to ensure ventilation at the bottom of the mettalic items. An eductor extension shall be used to discharge vapors a minimum of 3.7 meters above grade or 1 meter above adjacent roof lines,

whichever is greater. If this is not possible, alternative methods shall be proposed and approved prior to purging. Noise levels generated by these devices as a result of high airflow may exceed OSHA PELs. Noise levels shall be evaluated and appropriate hearing protection shall be provided.

b. Ventilation by Diffused Air Blowers: When using this purging method, the air-diffusing pipe is properly bonded and grounded to prevent the discharge of a spark. Fill (drop) tubes shall be removed to allow proper diffusion of the air in the tank. Air supply shall be from a compressor that has been checked to ensure that Grade D breathing air is being supplied. Air pressure in the tank shall not exceed 34 kPa (5 psi) gauge to avoid tank failure.

c. Commercial Emulsifiers and Volatile Fuel Encapsulators: These products are completely miscible in water, aid in the elimination of flammable vapors, and are biodegradable. Regulatory requirements for treatment and disposal of the water shall be determined prior to using this method. Standing outside the tank, the operator shall rinse the tank with a 3-to-6 percent solution of the product using a pressure sprayer through a tank opening. Explosive concentrations shall be measured at several levels (top, middle, and bottom) within the tank. If readings are greater than 10% of the LFL, the tank shall be rinsed again. When LFL readings are acceptable, the water in the tank shall be pumped out for disposal.

1.18.22 Inerting (No Entry)

Following the removal of contents from metallic items but prior to excavation and preparation activities, the metallic items shall be inerted only by introducing an inert gas, carbon dioxide (CO2) or liquid nitrogen (N2), to remove flammable vapors. Before inerting, all openings shall be plugged with threaded or expansion type plugs except the ventilation area and the opening to be used for introducing the inert gas. Within 30 minutes prior to initiating any activities (e.g., excavating, preparation, removal, opening, demolition, transportation, or other similar activities) involving mettalic items which has been inerted, the inerted nature of the metallic items (oxygen levels less than 8%) shall be verified.

a. CO2 fire extinguishers shall not be used for inerting the interiors of the metallic items. If a compressed gas (e.g., CO2 or N2) is introduced into the tank the following requirements shall be met to prevent the buildup of static electricity:

(1) The metallic items and the compressed gas supply tank shall be bonded together and grounded.

(2) The compressed gas shall be supplied only at low flows.

(3) The liquid or gas shall be released at the bottom of the metallic items so that static electricity is not generated by liquid falling to the bottom of the item. The item shall be slowly filled from the bottom up.

b. Dry ice, which evolves CO2 gas as it evaporates, if used, shall be introduced in the amount of at least 10 kg per 400 L (3 pounds per 100 gal)

of the container's capacity. Skin contact with dry ice shall be prevented by wearing heavy cloth gloves.

c. Sufficient quantities of inert gas (CO2 or N2) shall be introduced into the metallic items to lower the oxygen content to less than 8%. Pressure inside the tank shall not exceed 34 kPa (5 psi). Prior to proceeding with additional activities on the tank (e.g., excavating), the oxygen content of the tanks shall be monitored to confirm that it is less than 8%. Additional oxygen level monitoring shall be conducted at least hourly while activities involving the metallic items are underway but prior to decontamination of the interiors; at least daily during periods in which the metallic items are not being disturbed but prior to decontamination of their interiors; or as directed by the Contracting Officer. If monitoring of interiors indicates that oxygen levels are not remaining below 8%, additional inert gas shall be introduced and more frequent oxygen monitoring shall be initiated.

d. During inerting procedures, an extension vent tube a minimum of 3.7 meters above grade or 1 meter above any adjacent (within 22.5 meters) roof lines, whichever is greater shall be used to discharge vapors from the metallic items. If this is not possible, alternative methods shall be proposed and approved prior to inerting. Continuous combustible gas/oxygen monitoring shall be conducted at the vent and inert gas introduction holes.

1.18.23 Atmosphere Testing

The air within the metallic items shall be monitored to ensure the space is either adequately purged and safe for personnel entry, or to ensure it has been adequately inerted and the oxygen content is less than 8%. In both instances, monitoring shall be performed at the top, bottom, and middle areas of the metallic items to ensure stratification has not occurred. Monitoring results shall be reported to project personnel to ensure safe operations. Data shall be recorded as specified in paragraph EXPOSURE MONITORING/AIR SAMPLING PROGRAM.

1.18.23.1 Monitoring to Ensure Purging

When monitoring to ensure purging, both oxygen content and LFL readings are required. Prior to obtaining LFL readings, the Contractor shall monitor the oxygen content of the space and verify that the combustible gas indicators are operating within the oxygen limits identified by the CGI manufacturer. Personnel shall not be permitted to enter spaces with oxygen levels less than 19.5%, except in emergencies, and then only when equipped with the proper PPE and when following permit-required confined space entry procedures. Toxic air contaminants shall be monitored as specified in paragraph EXPOSURE MONITORING/AIR SAMPLING PROGRAM.

1.18.23.2 Monitoring to Ensure Inerting

Inerted metallic items shall be monitored to ensure oxygen readings remain below a maximum allowable percentage of 8% by volume.

1.18.24 Metallic Items Lifting

Metallic Items shall be lifted using equipment with a rated capacity greater than the load to be lifted. Personnel shall be directed to remain away from the ends of these metallic items whenever possible, with the ends oriented away from occupied or traveled areas. During transportation, the metallic items shall all be secured to prevent movement.

1.18.25 Dismantling

The excavated metallic items as part of this project shall be dismantled before being removed from the site and transported directly to a state permitted scrap metal facility. Dismantling shall not be performed until a decontamination of the interiors and exteriors (if necessary) is complete. Metallic items shall be inerted and tested before they are taken apart. Plans and procedures, including a list of materials and supplies, for safely and effectively dismantling shall be submitted in the SSHP.

1.18.26 Cleaning

Safety practices and procedures for the cleaning of the metallic items shall conform to API Std 2015. Decontamination shall be conducted utilizing only methods approved in the SSHP. The interior and exterior of the metallic items shall be decontaminated prior to removing it from the work site. Plans and procedures, including materials and supplies, for safely and effectively dismantling, cleaning surfaces of the interior and exterior of metallic items, and disposing of the decontamination fluids shall be submitted in the SSHP. Volatile organic solvents shall not be permitted to be utilized for decontamination procedures. Personnel shall not enter any of the metallic items as a part of this project, except as indicated in signed agreement from both COR and the Safety and Health Manager when following permit-required confined space entry procedures. Decontamination fluids shall be collected, drumed, tested and disposed. Upon completion of this project, written certification shall be made that the demolished existing hydrant fuelibng system was properly decontaminated prior to being removed from the site.

1.19 SITE CONTROL MEASURES

In order to prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, site control measures shall be established and described in the SSHP. The SSHP shall describe the methodology to be used by the Safety and Health Manager and SSHO in determining work zone designations and their modifications, and procedures to limit the spread of contamination. The SSHP shall include procedures for the implementation and enforcement of safety and health rules for all persons on the site, including employers, employees, outside Contractors, government representatives, and visitors.

1.19.1 Work Zones

Utilizing this guidance, work zone boundaries (exclusion zone, including restricted and regulated areas; contamination reduction zone; and support zone) and access points shall be established and the boundary delineations shall be indicated on the drawings and in the SSHP. Delineation of work zone boundaries shall be based on the contamination characterization data

and the hazard/risk analysis to be performed as described in paragraph: HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the Contracting Officer. Work zones shall be clearly identified and marked in the field (using fences, tape, signs, etc.). A site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the onsite office. Work zones shall consist of the following:

a. Exclusion Zone (EZ): The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the CRZ.

b. Contamination Reduction Zone (CRZ): The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas shall be separate and unique areas located in the CRZ.

c. Support Zone (SZ): The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The Support Zone shall be secured against active or passive contamination. Site offices, parking areas, and other support facilities shall be located in the Support Zone.

1.19.2 Site Control Log

A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable), and personal protective equipment utilized. Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they shall show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and shall fill out the Certificate of Worker or Visitor Acknowledgment. This visitor information, including date, shall be recorded in the log.

1.19.3 Communication

An employee alarm system that has adequate means of on and off site communication shall be provided and installed in accordance with 29 CFR 1910 Section .165. The means of communication shall be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals shall be distinctive and recognizable as messages to evacuate or to perform critical operations.

1.19.4 Site Security

Signs shall be printed in bold large letters on contrasting backgrounds in English and/or where appropriate, in the predominant language of workers unable to read English. Signs shall be visible from all points where entry might occur and at such distances from the restricted area that employees

may read the signs and take necessary protective steps before entering.

1.20 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the following personal hygiene and decontamination provisions. Decontamination shall be performed in the CRZ prior to entering the Support Zone from the Exclusion Zone. Chapter 10.0 of NIOSH Pub No. 85-115 shall be consulted when preparing decontamination procedures. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the SSHP. Employees shall be trained in the procedures and the procedures shall be enforced throughout site operations. Persons disregarding these provisions of the SSHP shall be barred from the site.

1.20.1 Decontamination Facilities

The following facilities shall be provided: 1) A personnel decontamination facility in the CRZ. This facility shall be used by both Contractor personnel and government representatives. The decontamination facility shall provide for separation of street clothing and contaminated PPE and shall be equipped with heating, lighting, ventilation, a change room and lockers, hot and cold water, shower facilities with hot and cold water, towels, soap in sufficient quantities for all anticipated personnel, and waste water storage facilities for controlling the disposal of used water. 2) Laundry facilities or provisions of laundry service. If an offsite laundry service is used, they shall be notified, in writing, of the possibility and nature of contaminants expected on clothing.

1.20.2 Procedures

Minimum decontamination procedures are listed below. Available site information shall be reviewed and these procedures shall be expanded and/or revised for submittal as part of the SSHP.

1.21 EQUIPMENT DECONTAMINATION

Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site. The procedures for decontamination of vehicles and equipment shall be addressed in the SSHP.

1.21.1 Decontamination Facilities

A equipment decontamination station shall be provided within the CRZ for decontaminating equipment leaving the EZ. The decontamination station shall include the following: A traffic surface consisting of a minimum of 12 inches of crushed rock. The crushed rock shall be underlayed by a chemically resistant impermeable flexible membrane, such as HDPE, PVC or VLDPE with a minimum thickness of [1][_____] mm. The liner shall be protected from damage on top with a geotextile. The base layer of soil on which the membrane is placed shall be free of objects greater than [9.5][_____] mm in diameter and any other materials which could puncture or

damage the membrane. The pad shall be constructed to capture decontamination water, including overspray, and shall allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. High pressure, low volume, water wash area for equipment and vehicles. A designated "clean area" in the CRZ for performing equipment maintenance. This area shall be used when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ shall be decontaminated before maintenance is performed.

1.21.2 Procedures

Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures shall address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Any item taken into the EZ shall be assumed to be contaminated and shall be inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials shall be cleaned and decontaminated prior to leaving the site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination.

1.22 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The SSHP shall describe the emergency and first aid equipment to be available onsite. The following items, as a minimum, shall be maintained onsite and available for immediate use:

a. First aid equipment and supplies approved by the consulting physician.

b. Emergency eyewashes and showers which comply with ANSI Z358.1.

c. Emergency-use respirators. For escape purposes, 5- to 15-minute emergency escape masks shall be supplied. For rescue purposes, 2 positive pressure self-contained breathing apparatus (SCBA) shall be supplied. These shall be dedicated for emergency use only and maintained onsite in the Contamination Reduction Zone.

d. Fire extinguishers with a minimum rating of 20-A:120-B:C shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

1.23 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section .120 (l) and 29 CFR 1926 Section .65 (l), shall be developed and implemented as a section of the SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all onsite employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition

of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to such expected emergencies. The plan shall be rehearsed regularly as part of the overall training program for site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing site conditions or information. Copies of the accepted SSHP and revisions shall be provided to the affected local emergency response agencies. The following elements, as a minimum, shall be addressed in the plan:

a. Pre-emergency planning. The local emergency response agencies shall be contacted and met with during preparation of the Emergency Response Plan. Agencies to be contacted include local fire, police, and rescue authorities with jurisdiction and nearby medical facilities that may be utilized for emergency treatment of injured personnel. At these meetings, the agencies shall be notified of upcoming site activities and potential emergency situations. The response agencies' capabilities shall be ascertained and written response commitments obtained. The Contractor shall ensure the Emergency Response Plan for the site is compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and Federal agencies.

b. Personnel roles, lines of authority, communications for emergencies.

c. Emergency recognition and prevention.

d. Site topography, layout, and prevailing weather conditions.

e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).

f. Specific procedures for decontamination and medical treatment of injured personnel.

g. Route maps to nearest prenotified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.

h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and/or their alternates).

i. Criteria for initiating community alert program, contacts, and responsibilities.

j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the

project, the appropriate government agencies shall be immediately notified. In addition, the Contracting Officer shall be verbally notified immediately and receive a written notification within 24 hours. The report shall include the following items:

(1) Name, organization, telephone number, and location of the Contractor.

(2) Name and title of the person(s) reporting.

(3) Date and time of the incident.

(4) Location of the incident, i.e., site location, facility name.

(5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.

(6) Cause of the incident, if known.

(7) Casualties (fatalities, disabling injuries).

(8) Details of any existing chemical hazard or contamination.

(9) Estimated property damage, if applicable.

(10) Nature of damage, effect on contract schedule.

(11) Action taken to ensure safety and security.

(12) Other damage or injuries sustained, public or private.

k. Procedures for critique of emergency responses and follow-up.

1.24 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a Contractor-generated certificate of worker/visitor acknowledgement shall be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the example certificate at the end of this section.

1.25 INSPECTIONS

The SSHO shall perform daily inspections of the jobsite and the work in progress to ensure compliance with EM 385-1-1, the Safety and Health Program, the SSHP and other occupational health and safety requirements of the contract, and to determine the effectiveness of the SSHP. Procedures for correcting deficiencies (including actions, timetable and responsibilities) shall be described in the SSHP. Follow-up inspections to ensure correction of deficiencies shall be conducted and documented. Daily safety inspection logs shall be used to document the inspections, noting safety and health deficiencies, deficiencies in the effectiveness of the SSHP, and corrective actions taken. The SSHO's Daily Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the following: date, work area checked, employees

present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer. In the event of an accident, the Contracting Officer shall be notified according to EM 385-1-1. Within 2 working days of any reportable accident, an Accident Report shall be completed on ENG Form 3394 and submitted.

1.26 SAFETY AND HEALTH PHASE-OUT REPORT

A Safety and Health Phase-Out Report shall be submitted within 10 working days following completion of the work, prior to final acceptance of the work. The following minimum information shall be included:

a. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.).

b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on site facilities.

c. Summary of exposure monitoring and air sampling accomplished during the project.

d. Signatures of Safety and Health Manager and SSHO.

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME CONTRACT NO.
PROJECT ADDRESS
CONTRACTOR'S NAME
[EMPLOYEE'S][VISITOR'S] NAME

The contract for the above project requires the following: that you be provided with and complete formal and site-specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Name Date

--- ---

FORMAL TRAINING: I have completed the following formal training courses that meet OSHA's requirements:

Date Completed

40 hour: ....._____
8 hour supervisory:....._____
8 hour refresher:....._____

SITE-SPECIFIC TRAINING: I have been provided and have completed the site-specific training required by this Contract. The Site Safety and Health Officer conducted the training. _____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in [the Contractor's] [my Employer's] Respiratory Protection program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy. _____

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in [the Contractor's] [my employer's] Respiratory Program and have received a satisfactory fit. [I have been assigned my individual respirator.] I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time._____

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests and may have included an evaluation of a chest ax-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

were no limitations to performing the required work tasks;

were identified physical limitations to performing the required work tasks.

Date medical exam completed

[Employee's][Visitor's] Signature _____
Date _____

Printed Name _____

Social Security Number _____

Contractor's Site Safety and Health Officer Signature _____

Date _____

Printed Name _____

Social Security Number _____

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 02051

REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 82	Protection of Stratospheric Ozone
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards for Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions
49 CFR 171	General Information, Regulations and Definitions
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

TEXAS ADMINISTRATIVE CODE (TAC)

Sections 335.91 - 335.94	Standards Applicable to Transporters of Hazardous Waste

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	Safety and Health Requirements Manual

(September 1996)

1.2 DEFINITIONS

1.2.1 Regulated Materials

Regulated materials are arsenic (As), cadmium (Cd), cesium, creosote, ethylene glycol, lead (Pb), mercury (Hg), diesel, ozone depleting chemicals (ODC), polychlorinated biphenyls (PCB), trichlorobenzene (TCB), diethylhexyl phthalate (DEPH), and tritium.

1.2.2 Arsenic

A solid and poisonous element that is commonly metallic, steel-gray, crystalline, and brittle. A poisonous trioxide of arsenic is used especially as an insecticide or weed killer. Typically, wood utility poles are treated with arsenic trioxide.

1.2.3 Ballast

A ballast is a device used to give starting voltage and/or stabilizing current to a fluorescent light tube. Ballast is a metal case filled with a solid or semisolid asphalt/tar substance that contain a capacitor. The capacitor may contain the following regulated materials: PCB, TCB or DEPH.

PCB was prohibited 1979 per 40 CFR 761. Approximately half of the ballasts made before 1979 contained PCB. "No PCBs" labels have been used to identify ballasts without PCB since 1 July 1978. Therefore all ballasts without "No PCBs" labels, with labels of fabrication on or before 1979 and no known date of fabrication are assumed as PCB ballasts. PCB-ballasts are regulated and disposal at a landfill is prohibited.

Ballasts from 4-foot lighting fixtures made before 1985 and from all other sizes of fixtures made before 1991 contained wet capacitors. The replacement dielectric fluid for PCBs in these wet capacitors is mineral oil and solvents. The hazardous solvents are typically TCB or DEPH. Unless the non-PCB ballasts are made after 1992, they are presumed to contain TCB or DEPH and shall be recycled at a permitted facility.

1.2.4 Cadmium

A bluish, white, malleable, ductile, toxic, bivalent, and metallic element. It is especially used in protective plating, bearing metals, and electrodes for batteries.

1.2.5 Cesium

A silver white soft ductile element of the alkali metal that is the most electropositive element known and is especially used in photoelectric cells that is typically in smoke detector. Cesium ignites spontaneously in moist air; causes burns in contact with skin; may explode in contact with sulphur or phosphorus; reacts violently with oxidizing materials. Cesium 137 is a radioactive poison.

1.2.6 Not Used

1.2.7 Creosote

A brownish oily liquid, consisting chiefly of aromatic hydrocarbons. It is obtained by distillation of coal tar and used especially as a wood preservative (i.e. wood utility poles).

1.2.8 Emergency Lights

The emergency lights are operated by a back-up power source such as a battery. Mercury, cadmium, and lead are typically used in batteries.

1.2.9 Fluorescent Light Tube

A light bulb (or tube in rod, circular, and U-shaped) of a fluorescent lighting fixture.

1.2.10 Lead

A heavy, soft, malleable, ductile, plastic but inelastic, bluish white, and metallic element. It is found mostly in combination and used especially in pipes, cable sheaths, batteries, solder, and shield against radioactivity.

1.2.11 Lighting Fixture

A unit containing a fluorescent light tube, light reflector, casing and ballast.

1.2.12 Mercury (Hg)

Mercury is a metal that is liquid at room temperature with a small vapor pressure. Mercury-containing items addressed in this specification are thermostats switches, fluorescent light tubes, rechargeable battery, and exterior mercury vapor lights.

1.2.13 Mercury Bulb Thermostat

A temperature control device containing a mercury ampule attached to a bimetallic sensing element.

1.2.14 Ozone Depleting Chemicals (ODC)

ODC include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halon, tetra (and tri) chloroethane, carbon tetrachloride and all isomers of methyl chloroform. A complete list of ODC are in \-40 CFR 82-\ Subpart A, Appendixes A and B. Items potentially containing ODC's are refrigeration equipment for HVAC systems, freezers, refrigerators, drinking fountains, ice machines, beverage and refrigerated food dispensers, halon fire extinguishers, and biomedical equipment.

1.2.15 Polychlorinated Biphenyls (PCBs)

PCB are defined in \-40 CFR 761-\. They are oily in pure form. PCBs can enter the body through lungs, gastrointestinal tract, skin, can circulate through throughout the busy, and can be stored in the fatty tissue. Available animal studies indicate an oncogenic potential. PCBs can cause adverse reproductive effects and developmental toxicity in humans. Items containing PCBs in this specification are ballasts and transformers (see definition of Ballast below).

1.2.16 Retorting Mercury

The retorting of mercury is a process whereby mercury is distilled from other materials by using heat. During the fluorescent light tube recycling process, mercury is retorting from phosphor powder that coats the inside of the glass tube.

1.2.17 Transformer

A device employing the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit. It contains PCB, TCB and/or DEPH. It is pole-mounted or pad-mounted.

1.2.18 Tritium

It is a low radioactive gas, radioactive isotope of hydrogen with atoms of three times the mass of ordinary light hydrogen atoms. It has very low radiotoxicity and is typically used in luminous instrument dials such as lighted exit signs.

1.2.19 Utility Pole

It is typically used for mounting power cable, panel, lighting, control switch, or electrical device such as transformers. An exterior wood pole is typically preserved by pressure treatment with application of arsenic trioxide or creosote.

1.2.20 Heating and Chilling Water

This type of system is used in military installations. It typically contains ethylene glycol (antifreeze), a regulated substance.

1.3 DESCRIPTION OF WORK

Work in this section is to be performed for the project, Fixed Wing Aircraft Park at Fort Hood, Texas. Work in this project shall be executed as Base Bid Work for Demolition of B/90079, B/90080, B/90049, B/90050 and existing concrete pavement). Prior to the start of demolition work, all items containing regulated materials shall be removed from the buildings. They shall be salvaged and recycled (including vehicle scale 90071) to the maximum extent possible or incinerated. Final disposal of regulated materials in a landfill shall be in accordance with applicable Federal, state, and local regulatory agencies, and when all means of recycling and reuse are exhausted. The Contractor shall be responsible for necessary licenses, permits, manifest, removal, disposal, worker's training, and any associated fees or other costs incurred in this section.

1.4 CONTRACTOR'S QUALIFICATIONS

The Contractor and subcontractors shall have at least 2 years experience with batteries and thermostats will be familiar with the Universal Waste Rules in accordance with \-40 CFR 273-\ and Mercury-Containing and Rechargeable Battery Recycling Act, Public Law 104-142, effective since May 13, 1996. The Contractor and subcontractors shall have at least 2 years experience with PCB-containing items and familiar with \-40 CFR 761-\. The Contractor and subcontractors shall have at least at least 2 years experience in purging and reclaiming ODC and certified in accordance with \-40 CFR 82-\. They shall also be familiar with 40 CFR 262, 263, 264, 268 and 49 CFR 171, 173, 178 and other applicable Federal, state and local regulations for work to be performed in this specification.

1.5 SUBMITTALS

Government approval is required for SUBMITTALS with a "GA" designation; SUBMITTALS having an "FIO" designation are for information only. The following shall be submitted in accordance with Section \=01330=\ SUBMITTAL PROCEDURES:

SD-01 Data

Contractor's Qualifications; GA.

Documentation of work experience in removal, recycling and/or disposal of items containing regulated material in accordance with paragraph, Contractor's Qualification. This document shall be submitted 30 days before start of work.

Certifications; FIO.

A copy of each ODC recovery and recycling equipment's certification in accordance with 40 CFR 82.158.

A copy of certification from each technician reclaiming ODC in accordance with 40 CFR 82.161 and 40 CFR 82.164.

Licenses and Permits; FIO.

A copy of the recycling/destruction facility license for handling, treatment and/or destruction of transformers containing PCB, TCB and/or DEPH.

Proof of state registration or a copy of permit for pumping, hauling and transporting waste (purged liquid from chiller, Purged liquid from diesel fuel tank) in accordance with TAC 334 and 335.91 - 335.94, and EPA permit per 40 CFR 263 if transporting to other state.

Disposal facility permit or written authorization from TNRCC to receive wood utility poles typically treated with arsenic or creosote.

Plans; FIO.

A written Spill Prevention Plan shall be prepared in accordance with EM 385-1-1 and paragraph, SPILLS AND SAFETY of this section shall be submitted at least 30 days before start of work.

Environmental Pollution Insurance; FIO.

A copy of the current environmental pollution liability insurance policy from the Contractor (subcontractors) and the recycling and/or destruction facilities.

SD-08 Statements

Closure Report; GA.

A report in accordance with paragraph, CLOSURE REPORT shall be prepared and submitted in 15 working days after completion of work in each site or before final payment.

1.6 WASTE MINIMIZATION, SALVAGE AND RECLAMATION

The Contractor shall segregate wastes to salvage and reclaim all items to their maximum extent and practice waste minimization. The Contractor shall not dispose of any item in its entirety to the landfill or by incineration. Regulated materials shall be manifested in accordance with 40 CFR 262, unless exemption is justified.

1.7 VERIFICATION OF REGULATED MATERIALS

Prior to initiation of work in this section, the Contractor shall field

verify the actual locations, quantities and categories of items containing regulated materials. The Contractor shall notify the Contracting Officer of any discrepancies or conflicts before performing work.

1.8 REMOVAL, HANDLING AND PACKAGING

1.8.1 Ballasts

The Contractor shall remove all ballasts from the lighting fixtures, inspect the label and segregate as non-PCB or PCB (see paragraph 1.2.3 Ballast), and place them into containers for shipping in accordance with 49 CFR 173. Leaking ballasts shall be placed in containers with absorbent material such as vermiculite or other suitable fire-retardant materials. Containers shall have affixed labels "Leaking PCB or Non-PCB with TCB or DEPH Ballasts". Intact ballasts shall be packed and labeled as "PCB or Non-PCB with TCB or DEPH Ballasts". A typical container shall not hold more than 220 ballasts or the total weight of each container shall not exceed 400 kilograms (or 882 pounds). PCB ballast shall be managed in accordance with 40 CFR 761. The Contractor shall coordinate with DPW Classification yard (phone: 254/288-7627) for turn-in of ballasts.

1.8.2 Lighted Exit Signs, Smoke Detectors, Emergency lights and Rechargeable Batteries

The Contractor shall field verify locations of these items. They shall carefully remove these items and inspect the labels on the lighted exit sign and smoke detector. Lighted exit sign with a yellow label "H3" and smoke detector with yellow label "AM241" typically contains radioactive substances. The Contractor shall contact the Mr. Mike Scott or Mr. Lynn (phone 254/287-3323) at Radiological G1 Safety to inspect the removed lighted exit signs and smoke detector. Containers with radioactive elements shall be removed by the Contractor to an approved radioactive substance storage area. Lighted exit signs and smoke detector containing radioactive elements shall be ultimately managed/recycled by Fort Hood. The Contractor shall be responsible for recycling or ultimate disposal of non-radioactive unit. Separate labeled container shall be used for each type of item. The container voids shall be filled with vermiculite or other suitable fire-retardant materials. Emergency lights with used batteries shall be placed in separate container labeled as "Emergency Lights with Used Batteries (Potential Hazard: lead, cadmium, mercury)". Other rechargeable batteries shall be placed in a separate container labeled as "Used Batteries (Potential Hazard: lead, cadmium, mercury)". The containers shall be vented and voids shall be filled with vermiculite or other suitable fire-retardant materials. The Contractor shall coordinate with DPW Classification yard (phone 254/288-7627 for turn-in of batteries.

1.8.3 Fluorescent Light Tubes and Lighting Fixtures

The Contractor shall remove the intact fluorescent light tubes from the lighting fixtures and place in the same boxes that held the replacement light tubes or other similar size containers that have box spacers to prevent breakage. Broken tubes shall be placed in containers in accordance with 49 CFR 173 and labeled as "Broken Fluorescent Light Tubes with Mercury". The containers with broken light tubes shall be manifested for transport and disposal in accordance with 40 CFR 262, 40 CFR 263, and 40 CFR 264. Metallic components of the lighting fixtures shall be recycled as scrap metal with other metallic components of the building structure. Plastic components of the lighting fixtures shall be segregated and recycled. The Contractor shall coordinate with DPW Classification yard (phone 254/288-7627) for turn-in of fluorescent light tubes and lighting fixtures.

1.8.4 Mercury Bulb Thermostats

The Contractor shall remove and handle mercury bulb thermostats in accordance with 40 CFR 273. Leaking or broken ones shall be placed in a container with absorbent such as vermiculite and labeled as "Broken Mercury Bulb Thermostats". They shall be manifested for transportation and disposal in accordance with 40 CFR 262, 40 CFR 263, and 40 CFR 264. Intact bulb thermostats shall be packed and labeled as "Intact Mercury Bulb Thermostats". The Contractor shall coordinate withe DPW Classification Yard (phone 254/288-7627) for turn-in mercury bulb thermostats.

1.8.5 ODC Units

The Contractor shall purge the used units (coolers of drinking water fountain, compressors of HVAC, refrigerator, freezer, window A/C, ice maker, etc.), and handle ODC in accordance with 40 CFR 82 Subpart F prior to removal from existing locations. The purged regulated refrigerants (ODC) shall be recycled and disposed of off post by the Contractor. The salvaged refrigerant R-22 (currently used on base) shall be stored in a separate retrievable container and turn-in to DPW Supply. The Contractor shall coordinate with DPW Environmental (phone 254/287-8712).

1.8.6 Diesel Engine and Fuel tank

Unless indicated otherwise by the COR, the diesel engine and fuel tank shall be disposed of with this Contract. Diesel fuel shall be purged to a separate retrievable container and turn-in to DPW Supply. The tank shall be decontaminated and disposed of in accordance with Section 02115 - Hydrant Fueling System Removal, and Sections 01450 and 01351 (see paragraph 1.5 Submittals).

1.8.7 Transformers

The Contractor shall verify the locations of transformers and obtain data plates information for the transformers to be removed. The Contractor shall perform sampling and analyses for PCB. Disconnection of electrical services shall be approved by DPW and coordinated with the COR. The Contractor shall provide a copy of analytical laboratory results and data plate information to DPW-Environmental Management Office (phone 254/287-8712). The Contractor shall prepare manifests (TNRCC-0311) with DPW Classification yard for both PCB-contaminated transformers (with PCB levels greater than 50 parts per millions (ppm) but less than 500 ppm) and PCB transformers (with PCB levels equal to or greater than 500 ppm). In accordance with 40 CFR 761.20, the Contractor shall provide containment at the staging area approved by the COR to prevent storm water pollution. The Contractor shall be responsible for final disposition of PCB-contaminated and PCB transformers (most likely Fort Hood will not have this type of transformer). The Contractor shall provide Certification of Destruction from a permitted facility to COR and the DPW-Environmental Office. Non-PCB transformer shall be disposed of by DRMO. Non-PCB transformers that are in good conditions shall be turn-in to DPW. Shipping description (which consists of RQ designation, shipping name, hazard class, UN identification number, packing group, and supplemental information) shall be in accordance with 49 CFR 173.

1.8.8 Utility Poles

The Contractor shall verify locations and sizes of wood poles. The Contractor shall coordinate with the DPW to verify utility poles to be removed with the demolition structures in this project. Utility poles shall be salvaged to the maximum extent possible by the Contractor.

However, if they are disposed as waste material, the disposal facility receiving those wood poles shall have permit or written authorization by the Texas Natural Resource Conservation Commission (TNRCC) to receive wood poles which are typically contaminated with arsenic and/or creosote.

1.8.9 Heating and Chilling Water System

The Contractor shall purge, triple rinse or pressure wash the system prior to dismantling. The purged fluid and contaminated rinse water shall be contained and labeled for recycling or disposal at a permitted facility. The Contractor shall provide Certificate of Destruction from the receiving treatment facility to the COR. The chiller shall be salvaged, recycled or disposed of by the Contractor (see paragraph 1.5 Submittals), unless is indicated otherwise by the COR.

1.8.10 Not Used

1.9 LABELING AND RECORD KEEPING

Labeling and record keeping of regulated materials to be salvaged, recycled, incinerated or placed in a landfill shall be in accordance with 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and all other applicable Federal, State and local regulations. Bill of lading shall be prepared for each item to be shipped to recycling and/or destruction. Information shall include initial date of storage, generator's name and address, destination address and telephone number and the shipping weight.

1.10 SPILLS AND SAFETY

The Contractor shall prepare, maintain and implement a Spill Prevention Plan. The plan shall establish policies and procedures to prevent spills, minimize spill impact on its surroundings and methods to cleanup. The plan shall encompass all activities including at the site, transportation to recycling and/or destruction facilities. It shall address all the safety and health concerns in accordance with 29 CFR 1926 in event of a spill. It shall address clean-up requirements in accordance with 29 CFR 1910.120 paragraphs (b) through (o). Clean-up personnel shall meet the training requirements of 29 CFR 1910.38 (a); 1910.134; and 1910.1200. As a minimum, the following items shall be addressed in the plan: cleanup of spill by the Contractor; verification and approval of final clearance by the Contracting Officer; personal protective equipment (PPE) and decontamination procedures; equipment and material required for cleanup; reporting required to notify state, local, and the Contracting Officer verbally and in writing. The plan shall be kept on-site. Spills of one pound or more of PCBs (typically from 16 or more ballasts) shall be reported within 24 hours to National Response Center (1-800-424-8802), the Contracting Officer and cleaned up immediately. The Contractor shall assume full responsibility for compliance with all Federal, state, and local regulations for workers protection, work practices, site safety, transportation and disposal.

1.11 STORAGE

A temporary storage area shall be provided by the Contractor and approved by the Contracting Officer. Storage time limits are 30 days for ballasts containing PCBs (40 CFR 761) and 1 year for thermostats containing Hg (40 CFR 273). All regulated materials must be removed from the site before final acceptance of this project by the Government.

1.12 TRANSPORTATION

Items containing regulated materials shall be transported by a licensed,

hazardous waste hauler. The Spill Prevention Plan shall be enforced by the Contractor to prevent spillage in accordance with 49 CFR 171 and 40 CFR 173. The hauler shall not store regulated materials longer than 10 days in accordance with 40 CFR 263 and 40 CFR 273. Vehicle loading, vehicle placarding, waste tracking, notification and record keeping shall be in accordance with all applicable Federal, State and local regulations.

1.13 RECYCLING/DESTRUCTION FACILITY

The Contractor shall use EPA permitted recycling, destruction facility in accordance with 40 CFR 261, 40 CFR 264 and 40 CFR 268 and/or state permitted or registered facility which holds current environmental pollution liability insurance coverage.

1.14 CLOSURE REPORT

The report shall contain: (1) A signed cover letter certifying completion of work described herein, (2) A signed Statement of Compliance, appended herein, (3) A brief narrative of worker protection and waste removal, segregation, packaging, transportation, and ultimate method of disposal (i.e. recycled/reuse, incinerated, landfill, etc.), (4) A description of accidents, ruptures, leaks, subsequent response procedures and cleanup, and (5) A copy of final disposition document (or Certificate of Destruction) of each item including at least the following: notification, signed manifest of waste, signed certificates or receipts (Bill of Lading) from each recycling or destruction facility.

STATEMENT OF COMPLIANCE

I hereby certify that:

(1) the appropriate state manifest form has been completely and properly filled out;

(2) the packing, marking, labeling and placarding of the waste meets all applicable regulations;

(3) the waste transportation, recycling, destruction and disposal meets all applicable Federal, State and local regulations.

Name_____

Title_____

Date_____

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 02090

LEAD-BASED PAINT (LBP) ABATEMENT AND DISPOSAL
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 178	Specifications for Packagings

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD-01	(1996) Lead-Based Paint: Guidelines for the Availability and Control of Lead-Based Paint Hazards in Housing

ENGINEERING MANUALS (EM)

EM 385-1-1	(1992) U.S. Army Corps of Engineers Safety and Health Requirements Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701 (1996) Methods of Fire Test for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH OSHA Booklet 3142 Lead in Construction

UNDERWRITERS LABORATORIES (UL)

UL 586 (1996) High-Efficiency, Particulate, Air Filter Units

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Equipment List; GA.

A list of equipment items to be used in the work, including brand names, model, capacity, performance characteristics, quantities and other pertinent information.

SD-08 Statements

Lead-Based Paint (LBP) Inventory; GA.

A written inventory shall be prepared that identifies the LBP containing debris for disposal. The LBP schedule on environmental drawing will be the basis of the inventory. Areas and materials identified as containing LBP shall be managed per paragraph 1.4 DESCRIPTION OF WORK, in this section. If the Contractor's inventory identifies additional LBP containing items for disposal, the Contractor shall analyze these items for TCLP-lead and make an amendment to the inventory. Costs of sampling and analysis to verify or add to the Contractor's LBP Inventory shall be approved by the Contracting Officer in advance.

Lead-Based Paint (LBP) Management Plan; GA.

The Contractor shall prepare a detailed LBP Management Plan that identifies the work procedures, health, and safety measures to be used in LBP abatement. Two copies of this plan shall be submitted 20 days prior to the pre-construction conference. One of the is for Rosemarie Olney, Industrial Hygienist, Fort Hood-DPW. The plan shall address the various sources of lead and the methods to be undertaken to abate the lead hazards to include the following key elements:

a. Description and location of LBP containing components keyed to project drawings.

b. Abatement methods for each LBP containing component.

c. Not Used.

d. Training requirements as required by Federal, state, and local regulations.

e. Unique problems associated with the LBP abatement project.

f. Sketch of LBP control areas and decontamination areas.

g. Eating, drinking, smoking, and rest room procedures.

h. Sequencing of LBP related work.

i. Personnel protective equipment; respiratory protection program and controls.

j. Engineering controls, containment structures and safety measures.

k. Worker exposure assessment procedures.

l. Work Practice controls.

m. Housekeeping.

n. Hygiene facilities and practice.

o. Medical surveillance, including medical removal protection.

p. Sampling, testing and analytical methods to include personal air sampling requirements of 29 CFR 1926 Section .62 for work in this section. Personal sampling shall be in accordance with NIOSH pub. 84-100 Method 7082 for lead. When specified or where required, dust wipe sampling (pre-abatement, during abatement and post abatement), soil sampling (pre-abatement, during abatement, and post abatement), and toxicity characteristic leaching procedure (TCLP-lead, EPA Method 1311/6010) of the waste material in accordance with 40 CFR 261 shall be used. Anaytical procedures must include frequency, locations, and sampling and analytical methods to be used.

Emergency Contingency Plan; GA

An emergency contingency plan shall be prepared in accordance with 40 CFR 261. Procedure must address the following LBP abatement hazards as appropriate to the project:

a. Negative air pressure system failure.

b. Major breech of containment barriers.

c. Detection of unexpected lead levels on adjacent grounds.

d. Spilling of lead debris bags or containers.

e. Phone numbers for project manager, local fire, police and medical personnel.

Waste Management Plan, Waste Handling and Site Storage Plan; GA.

A Waste Management Plan shall be prepared that complies with applicable requirements of Federal, state, and local LBP waste regulations and addresses:

a. Identification or documentation of potential LBP wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes; the facility location, phone number, and name of a 24-hour point of contact shall be included. If applicable, two copies of EPA, state, and local LBP waste permit applications, permits, and EPA identification numbers.

d. Names and qualifications (experience and training) of personnel who will be working on-site with LBP waste.

e. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and clean-up contingency measures to be implemented.

g. Work plan and schedule for waste containment, removal, and disposal. Waste shall be cleaned up and containerized daily.

h. Cost for LBP waste disposal according to this plan.

A Handling and Site Storage Plan shall be prepared that addresses the handling and storage of LBP debris in accordance with the requirement of 40 CFR 262 and 40 CFR 265. If manifesting is required, the Contractor shall confirm that an EPA identification number has been obtained so that proper manifesting of the waste will be addressed. The Contractor shall ensure site storage limitations, including the time of storage, container requirements, contingency plan, and personnel training have been complied with.

Waste Disposal Plan; GA.

A Waste Disposal Plan shall be prepared that will include but not be limited to the following:

a. A written confirmation that the debris will be treated and disposed of in accordance with the requirements of 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 264 and 40 CFR 268.

b. A written confirmation that transportation of the debris will be in accordance with 40 CFR 263.

c. Waste subcontractor's name, address, telephone number, and landfill location, including copies of licenses and signed agreements.

d. Landfill name, address, and telephone number. A copy of the landfill's state and locally issued license, and a signed agreement that the landfill will accept the LBP wastes.

e. Detailed delivery tickets prepared, signed, and dated by an agent of the landfill, certifying the amount of LBP containing materials delivered to the landfill, within 3 days after delivery.

SD-09 Reports

Sampling Result and Final Disposition Report; GA.

A daily log of the personal, and if applicable, the environmental air sampling test results shall be reviewed by the Competent Person and submitted to the COR, in written form, no more than 48 hours after completion of the sampling cycle. The log shall list each sample result,

sampling time and date, sample type, identification of personnel monitored, flow rate and duration, air volume sampled, yield of lead, cassette size, analytical method used, analyst's name and company, and interpretation of results. Results shall be reported in micrograms of lead per cubic meter (ug/m3) of air. Documentation of results that exceed specified limits (personal air samples that exceed 30 ug/m3 or as required by Federal, state or local requirements shall be highlighted in the log in such a manner to make them easily distinguishable from monitoring results that do not exceed specified or regulatory limits.

Final Disposition Report, including work performed and air monitoring results, in this section shall be provided prior to final payment. Separate copy of the daily air monitoring results and the Final Disposition Report shall be provided to the Environmental Management Office at DPW, Environmental Management Branch, B/4219, 77th St., Fort Hood, TX 76554-5028

SD-13 Certificates

Quality Assurance; GA.

Certificates shall meet the requirements of paragraph QUALITY ASSURANCE. The statements shall be signed and dated by a certifying officer after the award of this contract and contain the following:

a. Contractor's name and address.

b. Project name and location.

c. The specified requirements that are being certified as stated in paragraph 1.3.1 Qualifications, subparts a through f.

1.3 QUALITY ASSURANCE

1.3.1 Qualifications

a. Contractor: Certification that the Contractor has prior experience on LBP abatement projects similar in nature and extent to ensure the capability to perform the abatement in a satisfactory manner.

b. Competent Person: Certification that the Contractor's full-time on-site Competent Person meets the competent person requirements of 29 CFR 1926 Section .62 and is experienced in administration and supervision of LBP abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall have completed a Contractor Supervisor LBP abatement course by an EPA Training Center or an equivalent certification course, and have had a minimum of 2 years on-the-job experience.

c. Not Used.

d. Industrial Hygienist: Certification that the Industrial Hygienist meets the Office of Personnel Management Standard for the Industrial Hygiene Series GS-690, and has a minimum of two years experience in LBP abatement.

e. Testing Laboratory: The name, address, and telephone number of the independent testing laboratory selected to perform sampling and analysis for personal and environmental air samples, lead dust wipes, bulk sample analyses, and TCLP analysis. Documentation that the laboratory performing the analysis is an EPA National

Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT). Certification shall include accreditation for heavy metal analysis, list of experience relevant to analysis of lead in air, and a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors. Documentation shall include the date of accreditation or reaccreditation.

f. Blood Lead Testing Laboratory. The name, address and telephone number of the blood lead testing laboratory; the laboratory's listing by OSHA and the U.S. Public Health Service Center for Disease Control (CDC); and documentation that the laboratory certified in the state where the work site is located.

1.3.2 Respiratory Protection Devices

Manufacturer's certification of NIOSH or the Mine Safety and Health Administration (MSHA) approval for respiratory protection devices utilized on the site.

1.3.3 Cartridges, Filters, and Vacuum Systems

Manufacturer's certification of NIOSH approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate); High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges, filters, and HEPA vacuum systems.

1.3.4 Medical Records

Certification that employees who are involved in LBP abatement work have received medical examinations and will receive continued medical surveillance, including biological monitoring, as required by 29 CFR 1926 Section .62 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor expense, in accordance with 29 CFR 1910 Section .20.

1.3.5 Training

Training certification shall be provided prior to the start of work involving LBP abatement, for all of the Contractors' workers, supervisors and Competent Person. Training shall meet the requirements of 29 CFR 1926 Section .62, 29 CFR 1926 Section .59 and 49 CFR 172, and that required by EPA or the state LBP course for the work to be performed. Training shall be provided prior to the time of job assignment and, at least, annually. Training may cover all abatement methods or focus only on those methods specified in the LBP Management Plan. The project specific training shall, as a minimum, include the following:

a. Specific nature of the operation which could result in exposure to lead.

b. Purpose, proper selection, fitting, use, and limitations of respirators.

c. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the

fetus and additional precautions for employees who are pregnant).

d. Relevant engineering controls and good work practices.

e. The contents of any compliance plan in effect.

f. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

g. The employee's right of access to records under 29 CFR 1910Section .20.

1.3.6 Licenses and Permits

Copies of licenses and permits as required by applicable Federal, state, and local regulations shall be obtained at least 20 working days before the start of the LBP abatement project. The Contractor shall prepare the necessary document and obtain signature from the DPW-Environmental personnel who has signature authority. The Contractor shall provide a copy of the signed document to the Contacting Officer annotated with the date of of mailing to the regulatory agency.

1.4 DESCRIPTION OF WORK

Work in this section shall be performed at Fort Hood, Texas for the project Fixed Wing Aircraft Park. It includes Base Bid Work for demolition of 90071 (vehicle scale), Building 90079 (Air Lift Control Terminal, 10000 SF), and 90080 (Parachute Rigging Facility, 9000 SF); Building 90050 (Fire Station, 11646 SF); and Building 90049 (Control Tower and Ops Bldg., 23812 SF).

Lead-based Paint (LBP) Survey with x-ray fluorescent (XRF) analyzer was performed by COE for the above structures (reference [AM#1] _____ drawing [AM#1]s [AM#1]and attached detailed report of Lead Paint Inspection for physical locations of structures). XRF sample locations of painted surfaces are shown on the environmental drawings and XRF readings and TCLP-lead results are appended herein.

No lead based paint is detected in B/90079 and 90080, except in 90071. The demolition debris from 90079 and 90080 shall be disposed of as construction debris at the Fort Hood Landfill. However, LBP shall be abated (from airfield apron, hydrant fueling pits, and 90071) by removal of paint from the substrate. The TCLP-lead result of yellow paint chips from concrete (of 90071), based on COE survey, has non-detected level of leachable lead in (mg/l). The Contractor shall obtain a composite sample of debris to analyze for TCLP-lead analysis and verify disposal at Fort Hood Landfill. The Contractor shall salvage, to the maximum extent possible, bulk scrap metal and glass for recycling.

LBP abatement in B/90050, shall include (1) removal of wood components, with dark brown paint (soffit facia board), light gray paint (from wall, post and doors, etc.), and concrete vehicle bumper with yellow paint, (2) removal of yellow safety striping paint (see [AM#1]_____ [AM#1]report). The XRF readings of the dark brown paint are 7.5 mg/sq. cm. The XRF readings of light gray paint are ranged from 1.5 to 6.2 mg/ sq. cm. The XRF readings of the yellow paint is 2.2 mg/ sq. cm. The TCLP-lead result of dark brown paint is 12.5 mg/l, and is hazardous. The Contractor shall segregate the dark brown wood components and disposed of as hazardous waste. A composite sample of the dark brown wood debris shall be obtained and analyzed for TCLP-lead prior to disposal at a permitted treatment and disposal facility off post. The Contractor shall prepare waste manifest and obtain signature from authorized personnel at the DPW-Environmental.

No waste analysis for TCLP-lead was performed on the light gray wood component or the yellow paint in the COE survey. A composite sample of debris from the light gray wood component and yellow paint shall be obtained for TCLP-lead analysis by the Contractor to verify disposal at Fort Hood Landfill.

Soil sampling is required for B/90050, reference paragraph 3.4.5 Soil Sampling.

Post LBP abatement and recycling (of glass and metal) the whole structure (90050) shall be disposed of as construction debris. Since a weighted composite sample of building material simulating debris of B/90050 was obtained by COE at survey and the TCLP-lead result is 0.622 mg/l.

LBP abatement in B/90049, shall include component removal of (1) double wood door frame in basement, (2) wood door on the Control Tower 5th floor (see environmental drawings on sheet no. H-3). The wood door frame in basement hallway has total lead content of 2110 mg/kg (which is not classified as LBP) and no abatement is required. Post LBP abatement and recycling (of glass and metal) the whole structure (90049) shall be disposed of as construction debris at Fort Hood Landfill. The XRF readings of all building materials indicating an insignificant level of lead. A composite sample of demolition debris shall be obtained by the Contractor for TCLP-lead analysis and verify disposal at Fort Hood Landfill.

Asbestos-containing materials (Section 13280) and other regulated material (Section 02051) are present in these structures. The Contractor shall phase work in this section with the Contracting Officer Representative (COR).

The Contractor shall provide worker protection in accordance with 29 CFR 1926 Section .62 and perform initial assessment and worker exposure monitoring for all work in this section. The Contractor shall establish engineering controls, work and hygiene practices to minimize lead dust exposure to workers and environment when performing work in this section. The Contractor shall submit required plans in accordance with paragraph 1.2 SUBMITTALS and provide results to COR during abatement within 48 hours after completion of sampling. Disposal procedures are discussed in paragraph 3.6.6 DISPOSAL.

The Contractor shall be responsible for necessary licenses, permits, manifest, removal, disposal, worker's training, and any associated fees or other costs incurred in this section.

1.5 SITE VISIT

Contractor shall visit, investigate the site, review the drawings and specifications, assess the amount of LBP abatement and debris, and become familiar with conditions which will affect the work.

1.6 LIABILITY INSURANCE FOR LBP

LBP abatement liability insurance shall be obtained without additional expense to the Government. The Contractor shall assume full responsibility and liability for the compliance with Federal, state, and local regulations pertaining to training, work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

1.7 PROTECTION OF EXISTING WORK TO REMAIN

Abatement, storage, transportation, and disposal work shall be performed

without damaging or contaminating adjacent work and areas. Where such work or areas are damaged or contaminated, the Contractor shall restore work and areas to the original condition.

1.8 COORDINATION WITH OTHER WORK

Abatement and disposal work shall be coordinated with existing work and/or concurrent work being performed in adjacent areas. Employees in adjacent work areas shall be removed, if possible, during lead abatement activities.

1.9 SAFETY AND HEALTH REGULATORY REQUIREMENTS

Work shall be performed in accordance with requirements of EM 385-1-1and applicable regulations including, but not limited to 29 CFR 1910, 29 CFR 1926, especially Section .62. Matters of interpretation of the standards shall be submitted to the appropriate agency for resolution before starting work. Where these requirements vary, the most stringent shall apply. All employees in adjacent work areas shall be removed where possible during lead abatement activities.

1.10 PRECONSTRUCTION MEETING

The Contractor and the Competent Person shall attend a preconstruction meeting prior to starting any work involving LBP abatement. Items required to be submitted will be reviewed for completeness, and where specified, for acceptance.

1.11 ACCIDENT PREVENTION PLAN

1.11.1 Preparation and Implementation

The Accident Preparation Plan (APP) shall be prepared in accordance with EM 385-1-1, Appendix A. Where topic in Appendix A is not applicable, the APP shall justify its omission or reduced level of detail, and establish that adequate consideration was given to the topic. The APP shall cover on-site work by the Contractor or subcontractors. The Competent Person shall be responsible for development, implementation, and quality control of the content and actions required in the APP. For each anticipated work task, the APP shall establish hazards and control measures. The APP shall be easily readable and understandable by the Contractor's work force.

1.11.2 Acceptance and Modifications

The APP shall be prepared, signed and dated by the Contractors Competent Person and submitted 20 calendar days prior to the preconstruction meeting. Deficiencies in the APP shall be discussed at the Preconstruction Safety Conference and the APP shall be revised to correct the deficiencies, and resubmitted for acceptance. On-site work shall not begin until the APP has been accepted unless otherwise authorized by the Contracting Officer. One copy of the APP shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to personnel on the site. As work proceeds, the APP shall be adapted to new situations and conditions. Changes to the APP shall be made with concurrence of the Competent Person and Site Superintendent, and acceptance of the Contracting Officer. Should an unforeseen hazard become evident during performance of the work, the Competent Person shall bring such hazard to the attention of the Superintendent and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, the Contractor shall take necessary action to re-establish and maintain safe working conditions; and to safeguard on-site personnel, visitors, the public, and the environment. Disregard for provisions of this specification, or the accepted APP, shall be cause for stopping of work

until the matter is rectified.

1.11.3 Activity Hazard Analyses

An Activity Hazard Analysis (AHA) shall be prepared prior to beginning each major phase of the work and submitted for review and acceptance. Format shall be in accordance with EM 385-1-1, Section 1, Figure 1-1. A major phase of work is defined as an operation involving hazards not experienced in previous operations, or where a new work crew is to perform. The analysis shall define the activities and the sequence in which they are to be performed, specific hazards anticipated, and control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the Activity Hazard Analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss content of the AHA with everyone engaged in the activity, including the Government's on-site representative. The AHA shall be continuously reviewed and modified when appropriate to address changing conditions or operations. The accepted AHA shall be appended to and become part of the APP.

1.12 RESPIRATORY PROTECTION PROGRAM

A respiratory protection program shall be established as required by 29 CFR 1926 Section .103 and .62 and in accordance with 29 CFR 1910 Section .134. An approved respirator shall be furnished to each employee and visitor required to enter a LBP work control area. A fit test shall be conducted in accordance with 29 CFR 1926 Section .62, Appendix D.

1.13 HAZARD COMMUNICATION PROGRAM

A Hazard Communication Program shall be implemented in accordance with 29 CFR 1926 Section .59.

1.14 SAFETY AND HEALTH OVERSIGHT

The Competent Person shall be the on-site person responsible for coordination, safety, security and execution of the work. The Competent Person shall be able to identify existing and predictable lead hazards and shall have the authority to take corrective measures to eliminate them. The Competent Person shall be responsible for the initial assessment, worker exposure monitoring during abatement, and sampling required for abatement work, unless it is specified otherwise in the Contractor's LBP Management plan.

1.15 PREPARATORY INSPECTION MEETING

The Contractor, the Contractor's Competent Person, and the Contracting Officer's representative shall arrange and hold a preparatory inspection meeting immediately prior to beginning any LBP abatement. The APP, Activity Hazard Analyses, and the Contractor's LBP Management Plan, including containment, engineering controls, worker protection, training, and monitoring, will be reviewed for completeness.

1.16 TRAINED AND COMPETENT PERSONNEL

Work shall be performed by Competent Persons, qualified and trained in the abatement, enclosure, encapsulation, monitoring, testing, storage, treatment, hauling, and disposal of contaminated LBP debris material, and in subsequent cleanup of the affected environment. Workers shall comply with the appropriate Federal, state, and local regulations which mandate training requirements and work practices and shall be capable of performing the work under this contract.

1.17 POSTED WARNINGS AND NOTICES

The following regulations, warnings, and notices shall be posted at the work site in accordance with 29 CFR 1926 Section .62.

1.17.1 Regulations

Two copies of applicable Federal, state, and local regulations and NIOSH OSHA Booklet 3142 shall be maintained. One copy shall be posted at the work site and one copy shall be on file in the project office.

1.17.2 Warning Signs and Labels

Warning signs shall be provided at building entrances and approaches to LBP control areas containing airborne LBP debris. Signs shall be located at a distance from the LBP control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the LBP control area.

1.17.2.1 Warning Signs

Warning signs shall be in English and Spanish and be of sufficient size to be clearly legible and display the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

1.17.2.2 Warning Labels

Warning labels shall be in English and Spanish and be of sufficient size to be clearly legible and display the following:

CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.

1.17.3 Worker Information

Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, state, and local regulations.

1.17.4 Air Monitoring Results

Daily air monitoring results shall be prepared so as to be easily understood by the workers, and shall be placed in a clearly visible area of the work site.

1.17.5 Emergency Telephone Numbers

A list of telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor representatives who can be reached 24 hours per day, and professional consultants directly involved in the project.

1.18 EQUIPMENT AND MATERIALS

Sufficient quantities of health and safety materials required by 29 CFR 1926 Section .62, and other materials and equipment needed to complete the project, shall be available and kept on the site.

1.18.1 Respirators

Air-purifying respirators shall be approved by NIOSH for use with dust, fumes, and mists having permissible exposure limits less than 0.05 milligrams per cubic meter (i.e., have high-efficiency particulate air (HEPA) filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. Respirators shall comply with the requirements of 29 CFR 1926 Section .62 and shall be used in accordance with 29 CFR 1926 Section .103 and 29 CFR 1910 Section .134.

1.18.2 Respirator Cartridges

A sufficient supply of respirator cartridges shall be maintained at the work site to provide new cartridges to employees, authorized visitors, and Government personnel throughout the duration of the project. Cartridges shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the cartridge becomes wet.

1.18.3 Protective Clothing

The Contractor shall furnish, at no cost to personnel, equipment/clothing for protection from airborne and waterborne LBP debris. An adequate supply of these items shall be available for worker, authorized visitor, and Government personnel use. Workers and visitors shall not take protective clothing and equipment off the work site at any time. Protective clothing includes:

a. Coveralls (Whole Body Protective Coverings): Full-body coveralls and head covers shall be worn by workers in the work area. Sleeves shall be secured at the wrist and pants legs at the ankle with tape. Permeable clothing shall be provided in heat-stress conditions. Where non-disposable coveralls are provided, these coveralls shall be cleaned after each wearing. Cleaning of coveralls and other non-disposable clothing shall be in accordance with the provisions for cleaning in 29 CFR 1926 Section .62.

b. Boots: Work boots with non-skid soles or impermeable work boot covers shall be worn by workers. Where required by OSHA, safety boots (steel toe or steel toe and shank) shall be worn. Paint the uppers of boots red with waterproof enamel. Do not allow boots to be removed from the work area for any reason after being contaminated with LBP debris. Dispose of boots as LBP contaminated waste at the end of the work.

c. Gloves: Inner gloves, appropriate for items and hazards encountered, and disposable outer work gloves shall be provided to each worker and shall be worn while the worker is in the work area. Glove material shall be appropriate for the specific chemical exposure. Gloves shall not be removed from the work area, and shall be disposed of as LBP contaminated waste at the end of the work.

d. Hard Hats: Head protection (hard hats) shall be provided as required by OSHA and EM 385-1-1 for workers and authorized visitors. Protective plastic strap suspension hats shall be used. Hard hats shall be worn at all times that work is in progress. Hats shall remain in the work area until the project is completed. Hats shall be thoroughly cleaned, decontaminated, and bagged

before being removed from the work area at the end of the project.

e. Eye Protection: Fog-proof goggles for personnel engaged in LBP abatement operations shall be worn when the use of a full face piece respirator is not required.

f. Work Clothing: Cloth work clothes shall be provided for wearing under the disposable protective coveralls and foot coverings.

1.18.4 Expendable Supplies

1.18.4.1 Polyethylene Sheet and Bags - General

Polyethylene sheet and bags shall be minimum 6 mils thick. Bags shall have pre-printed labels, and 5 inch (minimum) long plastic ties, pointed and looped to secure the filled bags. Polyethylene sheets shall be in roll sizes to minimize seams.

1.18.4.2 Polyethylene Sheet - Flame Resistant

Where a potential for fire exists, flame-resistant polyethylene sheets shall be provided. Polyethylene film shall be frosted and shall conform to the requirements of NFPA 701.

1.18.4.3 Polyethylene Sheet - Reinforced

Reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the LBP control area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.18.4.4 Tape and Adhesive Spray

Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.

1.18.4.5 Containers

Impermeable containers shall be used to receive and retain lead contaminated material until disposal. Containers shall be labeled in accordance with EPA, DOT and OSHA standards.

1.18.4.6 Chemicals

Chemicals, including caustics and paint strippers, shall be properly labeled and stored in leak-tight containers.

1.18.5 Vacuum Systems

HEPA filtered vacuum systems shall be used during abatement operations which generate dust. The systems shall be suitably sized for the project, and filters shall be capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent.

1.18.6 Heat Blower Guns

Heat blower guns shall be flameless, electrical, paint-softener type with

controls to limit temperature to 1,100 degrees F. Heat blower shall be DI (non-grounded) 120 Vac, and shall be equipped with cone, fan, glass protector and spoon reflector nozzles.

1.18.7 Chemical Paint Strippers

Chemical paint strippers shall contain no methylene chloride and shall be formulated to prevent stain, discoloration, or raising of the substrate materials.

1.18.8 Chemical Paint Stripper Neutralizer

Neutralizers for paint strippers shall be used on exteriors only and shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

1.19 STORAGE OF MATERIALS

Materials shall be stored in a place and manner which protects them from damage and contamination. During periods of cold weather, plastic materials shall be protected from the cold. No flammable or hazardous materials shall be stored inside any building. Regularly inspect materials to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Any materials which become contaminated with LBP waste shall be disposed of consistent with the requirements of 40 CFR 148 and these specifications. Stored materials shall not present a hazard or an inconvenience to workers, visitors, and/or other occupants and employees of the building.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 NOT USED

3.2 WORK PROCEDURES

LBP abatement and related work shall be performed in accordance with the accepted Contractor's LBP Management Plan. Procedures and equipment required to limit occupational and environmental exposures to lead during LBP removal shall be in accordance with 29 CFR 1926 Section .62, and as specified herein. Paint chips and associated waste shall be disposed of in compliance with Federal, state, and local regulations.

3.2.1 Personnel Protection Procedures

Personnel shall wear and use protective clothing and equipment as specified. Eating, smoking, drinking, chewing tobacco and chewing gum, and applying makeup shall not be permitted in the LBP control area. Personnel of trades not engaged in the abatement and disposal of LBP shall not be exposed at any time to airborne concentrations of lead equal to or in excess of 30 micrograms per cubic meter (ug/m3) of air. Electrical service shall be disconnected when wet removal is performed, and temporary electrical service protected by a ground fault circuit interrupter shall be provided.

3.2.2 Safety and Health Procedures

The Competent Person shall be present on the work site throughout the abatement project to supervise, monitor, and document the project's health and safety provisions. A daily log shall be maintained showing the results

of sampling tests throughout the project area.

3.2.3 Safety and Health Responsibilities

The Competent Person shall:

a. Verify that training meets applicable requirements.

b. Review and approve LBP Management Plan for conformance to the applicable referenced standards.

c. Inspect LBP removal work for conformance with the accepted LBP Management Plan.

d. Ensure that worker exposure air monitoring activities are in accordance with 29 CFR 1926 Section .62.

e. Ensure work is performed in strict accordance with specifications.

f. Minimize exposure to personnel and to the environment.

The Competent Person shall be responsible for directing personal and environmental air monitoring, and lead dust wipe sampling (if necessary).

3.2.4 Medical Surveillance Procedures

Medical surveillance shall be implemented in accordance with the approved Contractor's LBP Management Plan, and shall comply with the requirements of 29 CFR 1926 Section .62, including the provisions for biological monitoring, medical removal protection and a physician's written opinion, signed by the physician performing the employee examination. The Contractor shall provide a copy of the written opinion for Contractor's employees 2 days prior to each employee's commencement of work.

3.2.5 Engineering Controls and Containment Structures

3.2.5.1 LBP Control Area

The LBP control area is where LBP abatement work occurs and as such shall be considered contaminated, and shall be isolated to prevent LBP containing dust or debris from passing into adjacent or open areas. The control area shall be decontaminated at the completion of the LBP abatement and disposal work.

3.2.5.2 Boundary Requirements

Physical boundaries shall be provided around exterior LBP control areas by roping off the area indicated in the LBP Management Plan. Interior projects shall be isolated by curtains, portable partitions, or other enclosures to ensure that concentrations of lead dust outside the LBP control area will not equal or exceed the pre-abatement level.

3.2.5.3 Control Barriers

The LBP control area shall be separated from other portions of the building and the outside with control barriers. The polyethylene sheeting will have all openings masked and sealed, and shall be erected according to the Contractor's LBP Management Plan. Polyethylene sheeting shall be mechanically supported, independent of duct tape or spray adhesive.

3.2.5.4 Preabatement Lead-Dust Wipe Samples

Preabatement lead-dust wipe samples shall be taken outside the LBP controlled area, in accordance with HUD-01. Samples shall be taken within 10 feet of the abatement structure at 20 percent of the area planned for abatement.

3.2.5.5 Masking and Sealing

a. Interior LBP control area requirements: Openings shall be sealed where the release of airborne LBP dust is expected. A control area shall be established with the use of curtains, portable partitions, or other systems in order to prevent the escape of dust from the contaminated control area. The control area shall be provided with protective covering of two layers of polyethylene sheeting over floors. Penetrations of the floor, walls, and ceiling shall be sealed with polyethylene sheeting and duct tape. Polyethylene sheeting shall be firmly attached to the structure. Joints shall be sealed with spray adhesive and duct tape. Openings shall be provided for the supply and exhaust of air for the negative air pressure system. Personal monitoring during the work shift shall be in accordance with 29 CFR 1926 Section .62.

3.2.5.6 Personnel Decontamination Unit Procedures

Decontamination units shall be constructed when required for the abatement procedures. Materials fabricated or delivered to the site before the shop drawings have been returned to the Contractor will be subject to rejection by the Contracting Officer. Specifications and drawings of portable prefab units, such as a trailer unit, if utilized, must be submitted for review and approval before start of construction. Submittal shall include, but not be limited to, a floor plan layout showing dimensions, materials, sizes, thicknesses, plumbing, and electrical outlets. Access between contaminated and uncontaminated rooms or areas shall be through an airlock. Access between any two rooms or room and trailer within the decontamination unit shall be through a plastic sheeting curtained doorway. A separate equipment decontamination unit shall be provided. Each work area shall have an emergency exit. The personnel decontamination unit's clean room shall be the only means of entrance and exit, except for emergencies, from the LBP control area. Materials shall exit the LBP control area through the equipment decontamination area.

3.2.5.7 Clean Room Procedures

The clean room shall have only one exit to non-contaminated areas of the building or site. An airtight seal shall be constructed of polyethylene between the clean room and the rest of the building. Surfaces of the clean room shall be protected with sheet polyethylene. A temporary unit with a separate equipment decontamination locker room and a clean locker room shall be provided for personnel who are required to wear whole body protective clothing. One locker shall be provided in each locker room for each LBP abatement worker, and each Contractor's representative. Lead-free personal clothing and shoes shall be kept in the clean locker. Hand wash station/showers shall be located between the equipment decontamination locker room and the clean locker room, and employees shall wash or shower before changing into personal clothes. An adequate supply of clean disposable towels shall be provided. LBP contaminated work clothing shall be cleaned. Clean rooms shall be physically attached to the LBP control area for areas inside the building but may be directly adjacent to the LBP control area outside of the building. Joint use of this space for other functions, such as offices, equipment storage, etc., is prohibited.

3.2.5.8 Hand Wash Station/Shower Room Procedures

An operational shower and hand washing station shall be provided between the work area and the clean changing room. Workers shall wash and/or shower before entering the clean changing room. Shower room shall be separated from other rooms by air tight walls fabricated from polyethylene sheeting. Water shall be hot and cold or warm. Shower heads and controls, soap dish, continuing supply of soap, and clean towels shall be provided. The shower shall be maintained in a sanitary condition. Waste water shall be pumped to drain and through waste water filters that meet state and/or local requirements. These filters shall be located inside the shower unit and filters shall be changed regularly. Spent filters shall be discarded as LBP contaminated waste.

3.2.5.9 Equipment Decontamination Unit Procedures

The Equipment Decontamination Unit shall be used for removal of equipment and materials from the LBP control area, and shall include a wash room, holding room, and an enclosed walkway. The unit shall be constructed from wood framing material and polyethylene sheeting. Workers shall not enter or exit the LBP control area through the Equipment Decontamination Unit. A washdown station, consisting of an enclosed shower unit, shall be located in the work area outside the Wash Room. The washdown station shall be used to clean equipment, bags and containers. Bagged or containerized LBP wastes shall be passed from the work area and cleaned in the Wash Room. The Wash Room shall be separated from the work area by a polyethylene sheeting flap. Wastewater shall be filtered and filters shall be changed as required for the shower unit and the Wash Room. Filters shall be disposed of as LBP contaminated wastes. The Holding Room shall be used as a drop location for bagged LBP passed from the Wash Room. This room shall be constructed so that bagged materials cannot be passed from the Wash Room through the Holding Room to the enclosed walkway. The walkway shall be separated from adjacent rooms by double flaps of 1/16 inch thick single ply rubber roofing materials of EPDM or Neoprene. The enclosed walkway shall isolate the Holding Room from the building exterior and shall be constructed of wood framing and polyethylene sheeting. The walkway shall provide access to the Holding Room from the building exterior. The enclosed walkway shall be separated from the exterior by a single flap of polyethylene sheeting.

3.2.5.10 Maintenance of Decontamination Units

Barriers and polyethylene sheeting shall be effectively sealed and taped. Containment barriers shall be visually inspected at the beginning of each work period. Damaged barriers and defects shall be immediately repaired upon discovery. Smoke methods shall be used to test effectiveness of barriers when directed by the Contracting Officer.

3.2.5.11 LBP Control Area Exiting Procedures

Personnel exiting a LBP control area shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

a. Vacuum all protective clothing before removing.

b. Remove protective clothing in the decontamination room, and place this clothing in an approved impermeable disposal bag.

c. Wash or shower.

d. Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated work site.

3.2.6 Furnishings

The Government will remove furniture and equipment from the work area before LBP removal work begins. The Contractor shall coordinate this effort with the COR.

3.2.7 Building Ventilating Systems

Any building ventilating system or any other system bringing air into or out of the LBP control work area shall be shut down and isolated by lockable switch; disconnecting wires; removing circuit breakers; isolated by airtight seals, or other positive means that will prevent spread of contamination through the system. Airtight seals shall consist of 2 layers of polyethylene. Individual seals shall be applied to ventilation openings (supply and exhaust), lighting fixtures, clocks, windows, doorways, elevator doors, stairs, ramps, speakers, and other openings into the work area. Seals shall be maintained until project decontamination is completed. After decontamination work has been completed and final air sample testing proves that the area is decontaminated, seals shall be removed and the ventilating systems may be operated again.

3.2.8 Temporary Utilities

Temporary equipment to provide adequate power, light, heat, and water shall be installed to accomplish the abatement operations properly and safely. The Contractor shall maintain the security and maintenance of the utility system in the LBP control areas. In the event of a failure of any utility system, the Government will not be responsible for any loss of time or other expense incurred by the Contractor. Wiring and electrical service shall be as specified in to Section 16415 Electrical Work, Interior or Section 16370 Electrical Distribution System, Aerial. In addition, the Contractor shall provide:

a. Backflow protection on all water connections. Fittings installed by the Contractor shall be removed after completion of work with no damage or alteration to existing water piping and equipment.

b. Heavy-duty abrasion-resistant hoses to provide water to each work area and decontamination area.

c. A hot water heater, if hot water is not supplied through the building's existing water supply to the decontamination showers.

d. Electrical service to work areas. Electrical service shall comply with NEMA, NECA, and UL standards. Warning signs shall be posted at power outlets which are other than 110-120 volt power. Only grounded extension cords shall be used. Incandescent lamps and light fixtures shall be of adequate wattage to provide good illumination in LBP control areas.

e. Temporary heating units, when needed, that have been tested and labeled by UL, FM, or another recognized trade association related to the fuel being consumed. Forced air or fan type units shall not be utilized inside a work area. Units shall have tip-over protection.

f. Sufficient quantity of single-occupant, self-contained chemical toilets, properly vented and fully enclosed, if permanent toilets are not available.

3.3 LBP ABATEMENT METHODS

3.3.1 Whole Component Removal

The painted wood components shall be removed and disposed of in their entirety.

3.3.2 Not Used

3.3.3 Not Used

3.3.4 Not Used

3.3.5 Not Used

3.3.6 Not Used

3.3.7 Chemical Stripping

The Contractor shall have choice of LBP removal method for the yellow safety striping from concrete substrate. The choice of LBP removal method shall be identified on the Contractor's LBP Management Plan. Chemical strippers containing methylene chloride are prohibited. Chemical stripping shall take place on-site. Stripping shall be done according to manufacturer's recommendations and the accepted Contractor's LBP Management Plan. Substrates shall be thoroughly washed and neutralized. Waste generated by the stripping process shall be handled in accordance with the accepted Contractor's Waste Management Plan, Waste Handling and Site Storage Plan. Adjacent finishes (i.e beams, walls and floors) shall be protected to prevent contamination.

3.3.8 Not Used

3.3.9 Vacuum Blasting

The Contractor shall have choice of LBP removal method for the yellow safety stripping on metal substrate (hydrant fueling pit). The choice of LBP removal method shall be identified on the Contractor's LBP Management Plan. The vacuum blasting system shall have HEPA filter. Work shall be performed in a LBP control area using negative pressure full containment with HEPA filtered exhaust. Paint residue shall be handled in accordance with the accepted Contractor's Waste Management Plan, Waste Handling and Site Storage Plan.

3.3.10 Needle Gun

The Contractor shall have choice of LBP removal method for the safety stripping on metal substrate. The choice of LBP removal method shall be identified on the Contractor's LBP Management Plan. The needle gun shall be fitted to HEPA vacuum systems. Work shall be performed in a LBP control area using negative pressure full containment with HEPA filtered exhaust. Paint residue shall be handled in accordance with the accepted Contractor's Waste Management Plan, Waste Handling and Site Storage Plan Waste Management Plan.

3.4 MONITORING

During the entire LBP removal and disposal operations, a Competent Person shall be on-site directing the monitoring/sampling and inspecting the work to ensure that the health and safety requirements of this contract are satisfied.

3.4.1 Personal Air Monitoring

Airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR 1926 Section .62. Results shall be reported in micrograms per cubic meter of air. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls, the adequacy of PPE and to determine if proper work practices are being employed. The Contracting Officer shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter of air. The Contractor shall take steps to reduce the concentration of lead in the air.

3.4.2 Wipe Sampling

Wipe sampling for surface lead dust concentrations shall be conducted in accordance with ASTM E1792 for wipe sample materials and HUD-01. Wipe sampling shall be conducted at:

a. Preabatement to establish a baseline when performing LBP abatement.

b. Not Used.

c. Post abatement to determine if specified clearance criteria has been met. The clearance standards are:

Floors: 100 ug/sq. ft.
Exterior: 800 ug/sq. ft.

3.4.2.1 Preabatement

Preabatement wipe samples shall be collected outside the LBP control area in accordance with paragraph Preabatement Lead-Dust Wipe Samples. Samples outside the LBP control work area shall be collected at critical barriers, in the clean room of the decontamination unit and in traffic control areas such as personal and equipment entrances.

3.4.2.2 to 3.4.2.4 Not Used

3.4.2.3 Post Abatement

Post abatement samples shall be collected in accordance with paragraph Final Clearance Testing.

3.4.3 Not Used

3.4.4 Waste Sampling and Testing

Sampling and testing of all waste in the paragraph 1.4 DESCRIPTION OF WORK shall be in accordance with 40 CFR 261.

3.4.5 Soil Sampling

Soil sampling is necessary to determine if total lead content in soil adjacent to B/90050 is affected by LBP soffit facia board or during abatement. Soil contamination during abatement or from accidental spillage shall be the responsibility of the Contractor, therfore, soil removal, testing, and disposal shall be conducted by the Contractor at no additional cost to the government.

3.4.5.1 Pre-abatement or Background Soil Sampling

Baseline total lead level in soil shall be obtained by composite soil sampling within the drip line of B/90050. Five (5) small portions of surface soil shall be scooped with a fresh 50 mL plastic centrifuge tube

and composited in the tube. This will represent a single composite sample. The laboratory shall utilize procedures in EPA Method 6010 for Total Lead analysis.

3.4.5.2 Post Abatement

Post abatement soil samples shall be collected in the same manner as the pre-abatement sample for B/90050 or at any spillage location. If soil samples has Total Lead levels at or above 400 mg/kg, the Contractor will be required to perform soil excavation to a depth of two inches in the area. The soil shall be removed, tested, and disposed as specified in paragraph CLEANUP AND DISPOSAL.

3.5 ADJACENT AREAS

Damage to adjacent areas shall be repaired to the approval of the Contracting Officer.

3.6 CLEANUP AND DISPOSAL

3.6.1 Cleanup

3.6.1.1 Daily

Surfaces in the LBP control area shall be maintained free of accumulations of paint chips and dust. Spread of dust and debris shall be restricted; waste shall not be distributed over the work area. Dry sweep or compressed air shall not be used for cleanup. At the end of each shift, the area shall be cleaned of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet mopping the area. LBP abatement work shall cease during the cleanup.

3.6.1.2 Prior to Clearance

Upon completion of the lead paint abatement and a satisfactory visual inspection by the Contracting Officer in a given work area, a preliminary clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the work area, except for critical barriers. The polyethylene sheeting shall be sprayed or misted with water for dust control, abatement debris removed and then the sheeting removed by folding it in upon itself. Polyethylene sheeting used for critical barriers shall remain in place until final clearance criteria. The following methodology shall be utilized during the cleanup prior to clearance.

a. Lead-contaminated debris shall be containerized in accordance with paragraph Contaminated Waste. Waste bags shall not be overloaded, shall be securely sealed and stored in the designated area until disposal.

b. Non-contaminated debris shall be containerized; removed from the work area and stored in the designated area until disposal in accordance with paragraph Non-Contaminated Waste.

c. Removal of surface polyethylene sheeting shall begin from upper levels such as cabinets and shelves. Removal of floor polyethylene sheeting shall begin at the corners and folded in the middle to contain the dust. Polyethylene shall be disposed of as specified for debris.

d. Cleaning. Once the polyethylene sheeting, except critical barriers is removed from the work area, cleaning shall begin. It

shall be done in the following sequence: HEPA Vacuum; Tri-Sodium Phosphate (TSP) wash (or equivalent cleaner); and HEPA Vacuum.

e. HEPA Vacuum. Vacuum all surfaces. Begin with ceilings and proceed down the walls, including window, doors, door trim and ending with floors. Begin vacuuming at the furthest corner from the entrance to the work area.

f. Wet Wash. Wash or mop the surfaces vacuumed in the same sequence. Contractor shall utilize a tri-sodium phosphate (TSP) detergent solution or other equally effective cleaning agent and allow surface to dry.

g. Cleaning Equipment. The Contractor shall prepare and use detergents containing five to ten percent TSP or other equally effective cleaning agent which shall be used in accordance with the manufacturers instructions. The waste water from cleaning shall be contained and disposed of according to applicable Federal, state, county and local regulations and guidelines. The waste water shall not be disposed of in storm sewers or sanitary sewers without specific and written Government approval.

3.6.2 Visual Inspection

Upon completion of the final cleaning, the Contractor shall notify the Contracting Officer and request a final visual inspection with the Contracting Officer's representative with the criteria in the final cleaning/visual inspection example format sheet located at the end of this section. If the area does not pass the visual inspection, the Contractor shall re-clean the area as required by paragraph CLEANUP AND DISPOSAL, at no additional expense to the Government. Final clearance testing shall not proceed until the Contracting Officer has accepted the final cleaning by the Contractor.

3.6.3 Final Clearance Testing

Final clearance surface dust sampling shall be conducted for the paint abatement task, after a thorough cleanup has been completed in accordance with the following:

On-site paint removal in limited areas. Three samples shall be taken from the floor in each area abated and one sample outside the containment area (within ten feet). Pre-abatement wipe samples shall be compared to determine if dust from the abatement process has contaminated non-abated areas. The Contractor shall cleanup these areas if contamination from the abatement process occurs.

Retests. If laboratory results indicate that the wipe test clearance level is exceeded, the Contractor shall re-clean the affected area, at no additional cost to the Government. The Contractor shall utilize specified cleaning methods. Retesting will then be performed to determine if specified clearance criteria was met. The Contractor shall pay for additional testing and shall provide, at no additional cost, a recleaning of an affected area until the clearance level is achieved. See paragraph 3.4.2 Wipe Sampling, for clearance standards.

3.6.4 Certification

The Competent Person shall certify in writing that inside the LBP control area and the area external to the LBP control area met final clearance requirements.

3.6.5 Removal of Control Area

After approval of the final clearance certification, and when authorized by the Contracting Officer, the LBP control area, containment barriers, and control structures roped-off boundary and warning signs shall be removed.

3.6.6 Disposal

3.6.6.1 Toxicity Characteristic Leaching Procedure (TCLP) Results

The results of the TCLP analysis, in accordance with 40 CFR 261, performed during abatement shall be used to determine disposal procedures.

Hazardous waste, has TCLP-lead result greater than or equal to 5 mg/l, shall be treated at a hazardous waste treatment facility and prior approval by TNRCC is required.

Class I waste, has TCLP-lead result greater than or equal to 1.5 mg/l but less than 5.0 mg/l, shall be managed as special waste and disposed of in a Type I municipal landfill with a dedicated special waste trench or a permitted industrial landfill. Class I waste shall require approval by TNRCC prior to disposal.

Class II waste, has TCLP-lead result less than 1.5 mg/l, shall be managed as construction debris and disposed of in a Type I/IAE, Type IV, or a permitted industrial landfill without prior approval by TNRCC.

Fort Hood Landfill at Turkey Run Road and Clarke Road will accept waste with TCLP lead result of less than 5.0 mg/l.

3.6.6.2 Contaminated Waste

Lead-contaminated waste, scrap, and debris shall be disposed of as follows:

a. Lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles shall be stored in U.S. Department of Transportation 49 CFR 178 approved 55 gallon drums. Each drum shall be labeled to identify the type of waste as defined in 49 CFR 172 and the date lead-contaminated wastes were first put into the drum. The Uniform Hazardous Waste Manifest forms from Federal and state agencies shall be obtained and completed. Land disposal restriction notifications shall be as required by 40 CFR 268. The Contracting Officer shall be notified at least 14 days prior to delivery to arrange for job site inspection of the drums and manifests. Lot deliveries of hazardous wastes shall be made as needed to ensure that drums do not remain on the work site longer than 90 calendar days from the date affixed to each drum. Contractor shall prepare a Waste Management and Site Storage Plan to identify interim storage location.

b. Lead-contaminated waste shall be handled, stored, transported, and disposed of in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Land disposal restriction notification shall be as required by 40 CFR 268.

c. Lead-contaminated soil shall be handled, stored, transported, and disposed of in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Land disposal restriction notification shall be as required by 40 CFR 268. Removed

lead-contmainated soil shall be stockpiled at an approved location by the COR and a representative soil sample shall be obtained from each 40 cubic meters and analyzed for TCLP-lead for disposal.

3.6.6.3 Non-Contaminated Waste

Non-contaminated waste, scrap, and debris from the building structure shall be disposed of as construction debris.

3.6.7 Disposal Documentation

Written evidence shall be provided that the hazardous waste treatment, storage, or disposal facility is approved for lead disposal by the EPA and state or local regulatory agencies. One copy shall be submitted of the completed manifest; signed, and dated by the initial transporter in accordance with 40 CFR 262.

3.6.8 Title to Materials

Materials resulting from demolition work, except as specified otherwise, shall become the property of the Contractor, for the duration of this contract, and shall be disposed of in accordance with Section 02220 DEMOLITION, except as specified herein.

3.6.9 Payment

Payment for disposal of waste will not be made until a Final Disposition Report is submitted and accepted by the COR, and a signed copy of the manifest or disposal receipt from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished to the Government.

CERTIFICATION OF FINAL CLEANING AND VISUAL INSPECTION

Individual abatement task as identified in paragraph,
Description of Work_____

In accordance with the clearing and decontamination procedures specified in the Contractor's lead hazard abatement plan and this contract, the Contractor hereby certifies that he/she has thoroughly visually inspected the decontaminated regulated work area (all surfaces, including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and has found no dust, debris, or lead containing material residue.

BY: (Contractor's signature)_____
Date_____
Print name and
title_____

(Contractor's On-site Supervisor signature)_____
Date_____
Print name and
title_____

(Contractor's Competent Person signature)_____ Date_____
Print name and
title_____

CONTRACTING OFFICER ACCEPTANCE OR REJECTION

The Contracting Officer hereby determines that the Contractor has performed final cleaning and visual inspection of the decontaminated regulated work area (all surfaces including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and by quality assurance inspection, finds the Contractor's final cleaning to be:

_____ Acceptable

_____ Unacceptable, Contractor instructed to re-clean the LBP control work area

BY: Contracting Officer's Representative

Signature_____
Date_____
Print name and
title_____

-- End of Section --

BASE BID

DETAILED REPORT OF LEAD PAINT INSPECTION FOR:
ROBERT GRAY ARMY AIRFIELD - BUILDING 90071 (VEHICLE SCALE)

Inspection Date:	11/16/99
Report Date:	11/22/99
Abatement Level:	1.0
Report No.	S#01360 - 11/16/99 17:55
Total Readings:	7
Job Started:	11/16/99 17:55
Job Finished:	11/16/99 18:32

READ NO.	ROOM NAME	SUBSTRATE	STRUCTURE	PAINT COLOR	LEAD (mg/cm²)
001	Exterior	Concrete	Border	Yellow	6.1
002	Exterior	Concrete	Border	Yellow	2.1
003	Exterior	Metal	Perimeter Band	Red	0.0
004	Exterior	Metal	Control Panel Box	Red	0.0
005	Exterior	Metal	Hatch Door	Red	0.0
006	Calibration Block				1.0
007	Wood Block				0.0

---- End of Readings ----

DETAILED REPORT OF LEAD PAINT INSPECTION FOR:
ROBERT GRAY ARMY AIRFIELD - BUILDING 90079

Inspection Date:	11/16/99
Report Date:	11/22/99
Abatement Level:	1.0
Report No.	S#01360 - 11/16/99 18:33
Total Readings:	41
Job Started:	11/16/99 18:33
Job Finished:	11/17/99 13:41

READ NO.	ROOM NAME	SUBSTRATE	STRUCTURE	PAINT COLOR	LEAD (mg/cm²)
001	Calibration Block				1.0
002	Calibration Block				1.0
003	Calibration Block				1.0
004	Wood Block				-0.1
005	Wood Block				-0.1
006	Wood Block				-0.2
007	Exterior	CMU	Wall	Beige	-0.1
008	Exterior	Metal	Siding	Beige	0.1
009	Exterior	Metal	Door	Beige	0.0
010	Exterior	Concrete	Baseboard	Beige	-0.2
011	Exterior	CMU	Wall	Beige	-0.1
012	Exterior	Concrete	Baseboard	Beige	0.0
013	Exterior	Metal	Door Casing	Beige	0.2
014	Exterior	Metal	Door	Beige	0.0
015	Mechanical Rm	CMU	Wall	Beige	0.0
016	Break Rm	Metal	Vertical I-Beam	Beige	0.0
017	Janitor Closet	Fiber Board	Wall Interior	Beige	0.0
018	Lunch Rm	Concrete	Beam Interior	Beige	-0.1
019	Lunch Rm	CMU	Wall Interior	Beige	-0.1
020	Flight Office	Sheetrock	Column	Beige	0.0
021	Entrance Rm	CMU	Wall	Beige	0.0
022	Entrance Rm	Sheetrock	Column	Beige	-0.1
023	Flight Office	Metal	Door Casing	Beige	0.0
024	Flight Office	Metal	Door	Beige	0.1
025	Stairway	Sheetrock	Wall	Beige	0.0
026	Stairway	Metal	Baseboard	Beige	0.0
027	Stairway	Metal	Riser	Beige	0.0
028	Stairway	CMU	Wall	Beige	0.0
029	Stairway	Metal	Handrail	Beige	0.3
030	Tower Rm	Sheetrock	Wall	White	0.0
031	Tower Exterior	Metal	Door	Brown	0.0
032	Main Rm	CMU	Wall	Beige	-0.1
033	Main Rm	Sheetrock	Column	Beige	0.0
034	Womens Restroom	Metal	Stall Door	Blue	0.0
035	Womens Restroom	Sheetrock	Ceiling	Beige	-0.1
036	Calibration Block				1.0
037	Calibration Block				1.0
038	Calibration Block				1.0
039	Wood Block				0.0
040	Wood Block				0.0
041	Wood Block				0.0

---- End of Readings ----

DETAILED REPORT OF LEAD PAINT INSPECTION FOR:
ROBERT GRAY ARMY AIRFIELD - BUILDING 90080

Inspection Date: 11/16/99
Report Date: 11/22/99
Abatement Level: 1.0
Report No. S#01360 - 11/16/99 15:49
Total Readings: 27
Job Started: 11/16/99 15:49
Job Finished: 11/16/99 17:38

READ NO.	ROOM NAME	SUBSTRATE	STRUCTURE	PAINT COLOR	LEAD (mg/cm²)
001	Calibration Block				1.3
002	Calibration Block				1.0
003	Calibration Block				1.0
004	Wood Block				-0.2
005	Wood Block				0.0
006	Wood Block				0.0
007	Interior	Wood Panel	Lower Wall	Beige	0.0
008	Interior	Metal	Door Casing	Beige	0.0
009	Interior	Metal	Door	Brown	0.0
010	Interior	Drywall	Wall	Beige	-0.1
011	Interior	Wood	Lower Wall	Beige	-0.1
012	Interior	Wood	Lower Wall	Beige	-0.1
013	Interior	Metal	Support Arch	Beige	0.0
014	Admin. Room	Wood Panel	Wall	Beige	-0.1
015	Admin. Room	Wood Panel	Wall	Beige	-0.1
016	Utility Closet	Drywall	Wall	Beige	0.0
017	Ladies Room	Drywall	Wall	Beige	-0.1
018	Mens Room	Drywall	Wall	Beige	-0.1
019	Interior	Wood	Ladder	Beige	-0.1
020	Exterior	Metal	Door	Brown	0.0
021	Exterior	Steel	Approach Pole	Beige	0.0
022	Exterior	Metal	Roll Door	White	0.4
023	Exterior	Metal	Wall	Beige	0.3
024	Calibration Block				1.0
025	Calibration Block				1.0
026	Wood Block				0.0
027	Wood Block				-0.1

---- End of Readings ----

ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEET

Client Name **Quest Micro Analytics, Inc.**

2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Project #
FID #

Site ID Ft Hood Bldg. 90071

Date Arrived 11/22/99
ETC Order Number 9911591

ETC Lab ID **9911591-01**
Sample ID: 90071-T01

Matrix :SOLID
Sample Date :11/16/99

TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
TCLP Extraction	Leachate		11/22/99		TL	1311
Lead - TCLP	ND	0.315		11/24/99	SH	6010B

DL - Detection Limit ND - Not Detected

LABORATORY MANAGER

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: &93190877	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90079, 90080, 90071	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu		
Phone No:817/978-3977 ext1645	Electronic Data Format: Use .pdf	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix									
11/16/99	90071-TD1 - Concrete & Yellow Paint Chips	Solid				X					

Relinquished by: J. Hall	Date/Time: 11-18-99 1200	Received by: Jennifer Gilman	Date/Time: 11/19/99 4:50pm
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT

EV-DI FORM SEP 97

QUEST
MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
Tel. 214.351.4441
Fax 214.351.4487

CHAIN OF CUSTODY RECORD

9911591

PROJECT NAME:	PROJECT MANAGER:	COMPANY NAME AND ADDRESS: *(BILL TO)*	P.O. NUMBER:
Ft. Hood Bldg. 90071		Quest, as above	
SAMPLER: *(SIGNATURE)*			PROJECT NUMBER:

CLIENT SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	ANALYSIS REQUESTED PLM/PCM/TEM/SEM	DATE RESULTS NEEDED	LAB SAMPLE NUMBER
90071-TD1	11/16/99		Concrete and Yellow Paint Chips	TCLP Lead (mg/L) EPA 1311/6010	10day turn.	

RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*
Jennifer Dolan	11/19/99 5:40pm				
RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*
RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	DATE / TIME	REMARKS	
		Rebekah Boozer	11/22/99 1525		

ENVIRONMENTAL TESTING & CONSULTING, INC.
2924 Walnut Grove Road • Memphis, TN 38111 • (901) 327-2750 • FAX (901) 327-6334
Founded 1972

November 29, 1999

Ms. Jennifer Jaber
Quest Micro Analytics, Inc.
2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Ref: Analytical Testing
ETC Order # 9911591
Project Description Ft Hood Bldg. 90071

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with Standard Methods 17th/18th Edition; The Solid Waste Manual SW-846; EPA Methods for the Analysis of Water and Wastes and/or 40 CFR part 136.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact our office if you have any questions.

Sincerely,

Nathan A. Pera, IV
Chief Executive Officer

rt
Attachment

QUEST

Certifications

Tennessee	*#TN02027*	*Mississippi*	
Arkansas		*Oklahoma*	*#9311*
Alabama	*#40730*	*Virginia*	*#00106*
Kentucky	*#90047*	*Washington*	*#C248*
North Carolina	*#415*	*US Army Corps of Engineers*	
South Carolina	*#84002002*		

BID OPTION NO. 1

SEQUENTIAL REPORT OF LEAD PAINT INSPECTION FOR BUILDING 90050
WEST FORT HOOD FIRE STATION

Inspection Date: 04/13/99
Report Date: 12/2/99
Abatement Level: 1.0
Report No. S#01360 - 04/13/99 21:31
Total Readings: 38
Job Started: 04/13/99 21:31
Job Finished: 04/14/99 15:47
Inspector: Bill Bird and Jack Cronkite

Read No.	Room Name	Substrate	Structure	Paint Color/Cond.	Lead (mg/cm²)
01	Calibration	Block			1.0
02	Calibration	Block			1.0
03	Calibration	Block			0.9
04	Calibration	Block			1.0
05	Calibration	Block			0.9
06	Roof	Wood	Soffit	Brown/Poor	**7.5**
07	No Record	Not Record	No Record	---------	**1.5**
08	Workout	Drywall	Wall Board	Yellow/Good	0.0
09	"	Wood	Window Facing	"	-0.1
10	"	Wood	Window Trough	"	0.0
11	"	Wood	Door	Varnished/Good	-0.1
12	"	Wood	Door Stop	Light Gray/Good	0.1
13	Corridor/Day Rm.	Wood	Wall	Light Gray/Good	0.0
14	Bunker	Drywall	Wall Board	Yellow/Good	0.1
15	"	Wood	Baseboard	"	0.0
16	Restroom	Sheetrock	Wall	"	0.0
17	"	Wood	Door Facing	Light Gray/Good	0.0
18	"	Sheetrock	Wall	Yellow/Good	0.1
19	"	Wood	Door	Light Gray/Fair	0.1
20	"	Wood	Door Jam (south)	Light Gray/Good	**1.5**
21	"	Wood	Door Jam (east)	Light Gray/Good	**2.0**
22	"	Sheetrock	Closet	Light Gray	0.0
23	"	Wood	Baseboard	Light Gray	0.0
24	Vehicle Bay	Wood	Wall (8 ft.)	Light Gray	0.1
25	"	Wood	Wall (4 ft.)	Light Gray	0.1
26	"	Wood	Door to Restroom	Light Gray	0.0
27	Storage	Wood	Wall Post	Light Gray/Poor	**6.2**
28	"	Wood	Stairway Landing	Light Gray	0.1
29	"	Wood	Stairway Rail	Light Gray	0.0
30	Storage 2nd floor	Wood	Wall	Light Gray/Poor	**2.9**
31	Vehicle Bay	Wood	Wall (9 ft.)	Light Gray/Good	**2.7**
32	"	Wood	Wall (4 ft.)	Light Gray/Good	0.2
33	"	Wood	Wall (9 ft.)	Light Gray/Good	0.7
34	Ext. Office	Wood	Door	Brown/Fair	0.0
35	Ext.	Aluminum	Siding	Yellow	0.3
36	Vehicle Bay	Cement	Floor Stripe	Yellow	**2.2**
37	SCBA Storage	Wood	Window Casing	Light Gray/Good	0.6
38	Ext. Door	Wood	Door	Brown/Good	0.1

---- End of Readings ----

Remarks: 1. Use LPA-1 Calibration Block
2. Reading #27, 9 feet of winscot has no paint

ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEET

Client Name **Quest Micro Analytics, Inc.**
2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Project #
FID #

Site ID USACE

Date Arrived 04/28/99
ETC Order Number 9904759

ETC Lab ID **9904759-01**
Sample ID: 90050-L01
WHOLE BLDG. MAT'L COMPOSITE SAMPLE

Matrix :SOLID
Sample Date :04/27/99

TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
TCLP Extraction	Leachate		04/29/99		TL	1311
Lead - TCLP	0.622	0.315		05/06/99	TD	6010B

DL - Detection Limit

LABORATORY MANAGER

ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEET

Client Name **Quest Micro Analytics, Inc.**

2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Project #
FID #

Site ID USACE

Date Arrived 04/28/99
ETC Order Number 9904759

ETC Lab ID **9904759-02**
Sample ID: 90050-L02

Matrix :SOLID
Sample Date :04/27/99

BROWN PAINT (SOFFIT)

TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
TCLP Extraction	Leachate		04/29/99		TL	1311
Lead - TCLP	12.5	0.315		05/06/99	TD	6010B

DL - Detection Limit

LABORATORY MANAGER

QUEST
MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
Tel. 214.351.4441
Fax 214.351.4487

CHAIN OF CUSTODY RECORD

9904-759

PROJECT NAME:	PROJECT MANAGER:	COMPANY NAME AND ADDRESS: *(BILL TO)*	P.O. NUMBER:
USACE			
SAMPLER: *(SIGNATURE)*			PROJECT NUMBER:

CLIENT SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	ANALYSIS REQUESTED PLM/PCM/TEM/SEM	DATE RESULTS NEEDED	LAB SAMPLE NUMBER
90050-L01			Building Material	TCLP Lead	10 days	
90050-L02			11	EPA 1311/6010	11	

RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*
Jennifer Quinn	4/27/99 10:30 am				
RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*
RELINQUISHED BY: *(SIGNATURE)*	DATE / TIME	RECEIVED BY: *(SIGNATURE)*	DATE / TIME	REMARKS	
		P Baugh	4/28/99 0830		

ENVIRONMENTAL TESTING & CONSULTING, INC.
2924 Walnut Grove Road • Memphis, TN 38111 • (901) 327-2750 • FAX (901) 327-6334
Founded 1972

May 7, 1999

Ms. Jennifer Jaber
Quest Micro Analytics, Inc.
2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Ref: Analytical Testing
ETC Order # 9904759
Project Description USACE

The above referenced project has been analyzed per your instructions. The analyses were performed in our laboratory in accordance with Standard Methods 17th/18th Edition; The Solid Waste Manual SW-846; EPA Methods for the Analysis of Water and Wastes and/or 40 CFR part 136.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact our office if you have any questions.

Sincerely,

Nathan A. Pera, IV
Chief Executive Officer

rt
Attachment

QUEST

Certifications

Tennessee	*#TN02027*	*Mississippi*	
Arkansas		*Oklahoma*	*#9311*
Alabama	*#40730*	*Virginia*	*#00106*
Kentucky	*#90047*	*Washington*	*#C248*
North Carolina	*#415*	*US Army Corps of Engineers*	
South Carolina	*#84002002*		

BID OPTION NO. 2

REPORT OF LEAD PAINT INSPECTION FOR BUILDING 90049 (CONTROL TOWER AND OPS BUILDING)

Inspection Date: 01/04/00
Report Date: 1/6/00
Abatement Level: 1.0
Report No. 01/04/00 10:04
Total Readings: 135 (Partial)
Job Started: 01/04/00 10:04
Job Finished: 01/05/00 13:42
Instrument: X-Ray Fluorescent Analyzer (RMD's LPA-1)

READ NO.	LOCATION	SUBSTRATE/STRUCTURE	PAINT COLOR	Lead mg/cm²	
1	CALIBRATION			0.9	Std
2	CALIBRATION			0.9	Std
3	CALIBRATION			0.8	Std
4	WOOD BLOCK			-0.1	Std
5	WOOD BLOCK			-0.1	QM
6	WOOD BLOCK			-0.1	QM
7	BASEMENT	CONCRETE/WINDOW SILL	BEIGE	-0.1	QM
8	BASEMENT	WOOD/DOOR FRAME	BEIGE	1.0	QM
9	BASEMENT	WOOD/DOUBLE DOOR	BEIGE	-0.1	QM
10	BASEMENT	CONCRETE/FLOOR	GRAY	-0.2	QM
11	BASEMENT	WOOD/DOOR FRAME	BEIGE	0.5	QM
12	BASEMENT	WOOD/DOOR	BEIGE	0.0	QM
13	BASEMENT	CONCRETE/WALL	BEIGE	-0.1	QM
14	BASEMENT	CONCRETE/WALL	BEIGE	0.0	QM
15	BASEMENT HALLWAY	STUCCO/WALL	BEIGE	0.3	QM
16	BASEMENT HALLWAY	WOOD/DOUBLE DOOR	BEIGE	-0.1	QM
17	BASEMENT/RESTROOM	STUCCO/WALL	YELLOW	0.1	QM
18	BASEMENT/RESTROOM	CEILING/STUCCO	YELLOW	0.1	QM
19	BASEMENT/HALLWAY	STUCCO/BASEMENT	BEIGE	0.0	QM
20	BASEMENT/HALLWAY	METAL/DOOR	BEIGE	0.0	QM
21	BASEMENT/HALLWAY	WOOD/DOOR FRAME	BEIGE	0.4	QM
22	BASEMENT/ROOM	CONCRETE/WALL	BEIGE	0.5	QM
23	BASEMENT/ROOM	WOOD/DOOR FRAME	GREEN	0.4	QM
24	BASEMENT/ROOM	CONCRETE/WALL	WHITE	0.1	QM
25	BASEMENT/HALLWAY	WOOD/DOOR	BEIGE	-0.1	QM
26	BASEMENT/HALLWAY	WOOD/BASEBOARD	BEIGE	0.0	QM
27	BASEMENT/HALLWAY	WOOD/DOOR FRAME (L01)	BEIGE	0.6	QM
28	1ST FLOOR	WOOD/PANEL	BROWN	-0.1	QM
29	BASEMENT/ROOM	SHEETROCK/WALL	BEIGE	0.0	QM
30	1ST FLOOR	WOOD/BASEBOARD ON STAIR	BEIGE	0.1	QM
31	STAIRWAY	WOOD/WALL TRIM	BEIGE	0.2	QM
32	STAIRWAY	SHEETROCK/CEILING	BEIGE	-0.1	QM
33	RESTAURANT	SHEETROCK/WALL	GRAY	0.1	QM
34	RESTAURANT	WOOD/DOOR	GRAY	0.0	QM
35	RESTAURANT	WOOD/DOOR FRAME	GRAY	0.0	QM
36	RESTAURANT	WOOD/BASEBOARD	GRAY	0.1	QM
37	RESTROOM 1ST FLOOR	SHEETROCK/WALL	WHITE	-0.1	QM
38	VIP ROOM	WOOD PANEL/WALL	BROWN	-0.1	QM
39	2ND FLOOR	WOOD/WINDOW SILL	BROWN	0.0	QM
40	2ND FLOOR	WOOD/PANEL/WALL	BROWN	0.0	QM
41	2ND FLOOR	WOOD/DOOR FRAME	BROWN	0.0	QM
42	2ND FLOOR	WOOD/WINDOW SILL	BROWN	0.0	QM
43	2ND FLOOR	WOOD PANEL/WALL	BROWN	-0.1	QM
44	2ND FLOOR	WOOD PANEL/COLUMN	BROWN	0.1	QM
45	2ND FLOOR RESTROOM	WOOD/WINDOW LEDGE	BEIGE	-0.1	QM
46	2ND FLOOR CLOSET	SHEETROCK/WALL	BEIGE	0.1	QM
47	2ND FLOOR OFFICE	WOOD PANEL/WALL	BROWN	0.0	QM
48	2ND FLOOR OFFICE	WOOD/ WINDOW SILL	BROWN	0.0	QM
49	2ND FLOOR OFFICE	SHEETROCK/CEILING	WHITE	0.0	QM

50	2ND FLOOR OFFICE	WOOD/DOOR FRAME	BROWN	-0.1	QM
51	2ND FLOOR MECH ROOM	SHEETROCK/WALL	WHITE	0.1	QM
52	2ND FLOOR MECH ROOM	SHEETROCK/WALL	GREEN	-0.1	QM
53	2ND FLOOR MECH ROOM	WOOD/BASEBOARD	BLACK	0.1	QM
54	2ND FLOOR OFFICE	WOOD PANEL/WALL	BROWN	-0.1	QM
55	EXTERIOR OVER 1ST FL	METAL SIDING/WALL	TAN	0.1	QM
56	EXTERIOR OVER 1ST FL	METAL/WINDOW FRAME	BROWN	-0.1	QM
57	STAIRWAY 2ND	STUCCO/WALL	BLUE	0.0	QM
58	STAIRWAY 2ND	STUCCO/WALL	WHITE	0.1	QM
59	STAIRWAY 2ND	WOOD/BASEBOARD	BLACK	0.0	QM
60	STAIRWAY 2ND	METAL/IBEAM	BLACK	2.5	QM
61	STAIRWAY 2ND	METAL/RISER	BLACK	2.3	QM
62	STAIRWAY 2ND	METAL/TREAD	BLACK	0.4	QM
63	STAIRWAY ON 2ND	WOOD/DOOR	BROWN	0.0	QM
64	STAIRWAY ON 2ND	WOOD/DOOR STOP	BROWN	0.0	QM
65	EXTERIOR	METAL/FACIAL ON PORCH	BROWN	0.0	QM
66	EXTERIOR	CONCRETE/SUPORT COLUMN	BROWN	-0.1	QM
67	EXTERIOR	METAL SIDING/WALL	BEIGE	0.1	QM
68	EXTERIOR	METAL/WINDOW FACING	BROWN	0.0	QM
69	EXTERIOR	METAL SIDING/WALL	BEIGE	0.1	QM
70	EXTERIOR	METAL/BASE FACING	BROWN	0.0	QM
71	EXTERIOR BASEMENT	METAL/WINDOW FRAME	BROWN	8.2	QM
72	EXTERIOR BASEMENT	WOOD/DOOR	BROWN	-0.1	QM
73	EXTERIOR BASEMENT	WOOD/DOOR FRAME	BROWN	0.0	QM
74	EXTERIOR BASEMENT	METAL/HANDRAIL	BROWN	2.2	QM
75	EXTERIOR	METAL SIDING/WALL	BEIGE	0.2	QM
76	EXTERIOR	WOOD/SCREEN DOOR	BROWN	0.0	QM
77	EXTERIOR	METAL/WINDOW CASING	BROWN	0.0	QM
78	EXTERIOR TOWER	METAL/WALL	BEIGE	7.4	QM
79	CALIBRATION			1.0	QM
80	CALIBRATION			1.0	QM
81	CALIBRATION			1.0	QM
82	WOOD BLOCK			-0.1	QM
83	WOOD BLOCK			0.0	QM
84	WOOD BLOCK			-0.1	QM
85	CALIBRATION			1.0	QM
86	CALIBRATION			1.0	QM
87	CALIBRATION			0.7	QM
88	WOOD BLOCK			-0.1	QM
89	WOOD BLOCK			0.0	QM
90	WOOD BLOCK			0.1	QM
91	3RD FLOOR	STUCCO/WALL	GRAY	-0.1	QM
92	3RD FLOOR	WOOD/DOOR	BEIGE	0.0	QM
93	3RD FLOOR	STUCCO/WALL	GREEN	0.1	QM
94	3RD FLOOR	WOOD/DOOR JAMB	WHITE	0.0	QM
95	3RD FLOOR	STUCCO/CEILING	WHITE	-0.1	QM
96	3RD FLOOR	SHEETROCK/WINDOW END	WHITE	0.0	QM
97	3RD FLOOR	WOOD/BASEBOARD	WHITE	0.0	QM
98	4TH FLOOR	WOOD/WINDOW SILL	GRAY	0.0	QM
99	4TH FLOOR	STEEL/WINDOW FRAME	GRAY	0.0	QM
100	4TH FLOOR	METAL/DOOR JAMB	GREEN	0.0	QM
101	4TH FLOOR	STUCCO/WALL	GREEN	-0.1	QM
102	5TH FLOOR	METAL/DOOR JAMB	BLUE	0.0	QM
103	5TH FLOOR	WOOD/DOOR JAMB	GREEN	-0.1	QM
104	5TH FLOOR	WOOD/BASEBOARD	BLACK	0.0	QM
105	5TH FLOOR	WOOD PANEL/WALL	GREEN	-0.1	QM
106	5TH FLOOR	WOOD/DOOR	GREEN	3.4	QM
107	5TH FLOOR	WOOD/DOOR	BLUE	-0.1	QM
108	5TH FLOOR STAIRWAY	STUCCO/WALL	WHITE	-0.1	QM
109	5TH FLOOR	WOOD/DOOR	BLACK	3.0	QM
110	5TH FLOOR	WOOD/DOOR	WHITE	-0.1	QM
111	5TH FLOOR	WOOD/DOOR CASING	BLACK	0.1	QM
112	5TH FLOOR STAIRWAY	METAL/HEATER	BLUE	0.0	QM

113	5TH FLOOR	SHEETROCK/WALL	WHITE	-0.1	QM
114	6TH FLOOR	STUCCO/WALL	GREEN	0.1	QM
115	6TH FLOOR	WOOD/DOOR	GREEN	0.0	QM
116	6TH FLOOR	SHEETROCK/WALL	GREEN	-0.1	QM
117	6TH FLOOR	STUCCO/CEILING	WHITE	0.0	QM
118	7TH FLOOR	STUCCO/WALL	WHITE	0.0	QM
119	7TH FLOOR	STEEL/IBEAM	WHITE	1.0	QM
120	7TH FLOOR	STEEL/UTILITY DOOR	BROWN	1.0	QM
121	7TH FLOOR	WOOD/DOOR	BLUE/GRAY	0.0	QM
122	7TH FLOOR	METAL/DOOR CASING	BLUE	0.0	QM
123	7TH FLOOR RESTROOM	WOOD/DOOR	BLUE	-0.1	QM
124	7TH FLOOR RESTROOM	STUCCO/WALL	BLUE	-0.1	QM
125	7TH FLOOR STAIRWAY	STEEL BEAM/LADDER	BLACK	2.0	QM
126	CONTROL TOWER	METAL/WINDOW SILL	BLACK	0.0	QM
127	CONTROL TOWER	METAL/SUPPORT BEAM	BLACK	0.1	QM
128	CONTROL TOWER EXT.	METAL SIDING/WALL	BEIGE	5.5	QM
129	CONTROL TOWER EXT.	STEEL/DECK	BROWN	0.2	QM
130	CONTROL TOWER	WOOD/SUPPORT WINDOW SILL	BLACK	-0.1	QM
131	CALIBRATION			1.0	QM
132	CALIBRATION			1.0	QM
133	CALIBRATION			1.0	QM
134	WOOD BLOCK			-0.2	QM
135	WOOD BLOCK			0.0	QM

---- End of Readings ----

ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEET

Client Name Quest Micro Analytics, Inc. Project #

2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Site ID Fort Hood

Date Arrived 01/10/00
ETC Order Number 0001160

ETC Lab ID 0001160-01
Sample ID: 90049-L01

Matrix :SOLID
Sample Date :01/05/00

TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED	BY	METHOD
Lead	2,110	mg/Kg	10.0	1600	01/11/00	JF	7420

CHAIN OF CUSTODY RECORD

Lab. PR&C No.: % 93190877
Proj Mngr: Poy Har Kathleen Wu
Phone No: 817/978-3977 ext1645

Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90049
Electronic Data Format: Use .pdf

Site/Feature: Ft. Hood

FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT – on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix											X
1/5/2000	90049-L01 Beige Paint Chip	Solid											

Relinquished by: J. Hall	Date/Time: 01-06-2000 1300	Received by: [signature]	Date/Time: 1/7/00 10:40 am
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT

EV-DI FORM SEP 97

ENVIRONMENTAL TESTING & CONSULTING, INC.
2924 Walnut Grove Road • Memphis, TN 38111 • (901) 327-2750 • FAX (901) 327-6334
Founded 1972

January 12, 2000

Ms. Jennifer Jaber
Quest Micro Analytics, Inc.
2530 Electronic Lane, Ste 712
Dallas, TX 75220-1229

Ref: Analytical Testing
ETC Order # 0001160
Project Description Fort Hood

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with Standard Methods 17th/18th Edition; The Solid Waste Manual SW-846; EPA Methods for the Analysis of Water and Wastes and/or 40 CFR part 136.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact our office if you have any questions.

Sincerely,

Nathan A. Pera, IV
Chief Executive Officer

rt
Attachment

QUEST

Certifications

Tennessee	*#TN02027*	*Mississippi*	
Arkansas		*Oklahoma*	*#9311*
Alabama	*#40730*	*Virginia*	*#00106*
Kentucky	*#90047*	*Washington*	*#C248*
North Carolina	*#415*	*US Army Corps of Engineers*	
South Carolina	*#84002002*		

SECTION 02115

HYDRANT FUELING SYSTEM REMOVAL
AMENDMENT #0001

PART 1 GENERAL

The section covers work for removal of the existing hydrant fueling system at the Robert Gray Army Airfield, Fort Hood, Texas. The hydrant fueling system and piping are indicated on the drawings as fuel lines (majority of fuel lines are 150 mm or 200 mm in diameter, with one portion of fuel line in 300 mm diameter), fuel hydrants (or hydrant fuel pits, approx. 2 feet in depth), fuel vaults (or valve boxes, less than 2 feet in depth), fuel manholes, fuel surge suppressors, etc.

Work to be performed for the portion of hydrant fueling system beneath the airfield apron and existing pavement between buildings 90079 and 90080 shall include purging, cleaning, and inerting of fuel lines; testing and disposal of fluid (including liquid in the hydrant fueling pits, valve boxes, and manholes, etc.); visual examination, screening, sampling and testing of soil, (and disposal of limited quantity of contaminated soil).

In addition, this section also covers work for testing, and disposal of the wastewater contaminated with JP-8 Fuel from flushing the new hydrant fueling system (i.e. product recovery tank, sump pits and drains, valve boxes and drains) in Section 015899 - SYSTEM START-UP, FUELING SYSTEM. If wastewater generated from this activity is uncontaminated, it shall be disposed of through an oil water separator (and/or) into the base sanitary sewer system. The Contractor shall provide analytical data and identify point of discharge for approval from the Contracting Officer Representative (COR).

The initially purged fuel (or product) shall be salvaged and placed in a retrievable container and turn-in to DPW-Supply. The Contractor shall review demolition drawings from all design disciplines and verify conditions. The Contractor is responsible for necessary licenses, permits, manifest, removal, disposal, required worker's training, and any associated fees or other cost incurred in this section.

The Contractor shall phase work of testing contaminated water from flushing the new hydrant fueling system.

The Contractor shall notify contamination (of the excavated soil, water and soil in the excavation) to the Contracting Officer Representative (COR) immediately (and the COR shall notify the DPW-Environmental Division, phone 254/287-6499, within 24 hours).

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referenced in the text by basic designation only.

AMERICAN PETROLEUM INSTITUTE (API)

API Publ 2217A	(1987) Guidelines for Work in Inert Confined Spaces in the Petroleum Industry
API Publ 2219	(1986) Safe Operation of Vacuum Trucks in

	Petroleum Service
API RP 1604	(1996) Closure of Underground Petroleum Storage Tanks
API RP 2003	(1991) Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents
API Std 2015	(1994) Safe Entry and Cleaning of Petroleum Storage Tanks

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.)
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of

Underground Storage Tanks (UST)

TEXAS ADMINISTRATIVE CODE (CFR)

30 TAC CH-334	Underground and Aboveground Storage Tanks
30 TAC CH-335	Industrial Wastes and Hazardous Wastes
30 TAC CH-350	Texas Risk Reduction Program

1.2 MEASUREMENT AND PAYMENT

Compensation for removal of contaminated soil and replacing with clean backfill shall be paid as one unit cost (when contaminated soil is identified and in limited quantity as specified). Payment for all work in this section shall be under the base bid and it shall constitute full payment for all work defined in PART 1 GENERAL, except for airfield demolition and disposal, disposal of clean hydrant fueling system, excavation, stockpiling, trenching and backfilling. Demolition of airfield shall be in accordance with Section 02220 - DEMOLITION. Excavation, stockpiling and backfill of material shall be in accordance with Section 02316 - EXCAVATION, TRENCHING, BACKFILLING FOR UTILITIES SYSTEMS. Extent of excavation shall be to remove the existing hydrant fueling system.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation, submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Work Plan; GA.

The Work Plan within 30 days after notice to proceed. The Contractor shall allow 30 days in the schedule for the Government's review and approval. No adjustment for time or money will be made for resubmittals required as a result of noncompliance. The Work Plan shall also discuss how work (including number of samples to draw and test parameters) described in PART 1 GENERAL shall be accomplished. Reference paragraph 1.6.2 Work Plan this section.

SD-08 Statements

Qualifications, Licenses, and Permits; GA.

A document indicating that the Contractor meets the specified requirements. Proofs, licenses and/or permits from hauler and treatment and/or disposal facility.

SD-09 Reports

Contaminated Liquids, Sludge, Excavated Water Testing and Disposal; GA.
Soil Examination, Testing, and Analysis; GA.

Reports including the chain-of-custody records.

Copies of all laboratory and field test reports.

Hydrant Fueling System Closure Report; GA.

3 copies of the report prepared in a standard 3-ring binder, within 14 days of completing work at each location. Each binder shall be labeled with contract number, project name, location marked on a drawing, photographs; each binder shall be indexed. A copy of the report shall be furnished to the DPW-Environmental through the COR. Also reference paragraph 3.14 Hydrant Fueling System Closure Report for detail information.

SD-18 Records

Salvage Rights; GA.

A record of the disposition of salvaged materials at the end of the contract.

1.4 QUALIFICATIONS

The Contractor shall have a minimum of 2 years of underground storage tank removal experience and shall be certified by the State of Texas for underground storage tank removal work.

1.4.1 Laboratory Services

For laboratory services the Contractor shall be validated in accordance with Corps of Engineers (COE) validation requirements specified in Section 01450 CHEMICAL DATA QUALITY CONTROL.

1.4.2 Support Staff

The Contractor shall identify all staff involved for the various work tasks in this section, including personnel collecting and shipping samples. The qualifications of these staff members shall be detailed by the Contractor.

1.5 REGULATORY REQUIREMENTS

1.5.1 Permits and Licenses

The Contractor, as required or as directed by the COR, shall obtain local, state, or federal permits and licenses that directly impact the Contractor's ability to perform the work prior to work. Training required for Safety and health for hazardous waste site shall reference Section 01351.

1.5.2 Statutes and Regulations

Work in this section shall be carried out in accordance with 40 CFR 280, 40 CFR 262, 40 CFR 264, and 40 CFR 265 as well as the applicable local and State of Texas regulations, 30 TAC Chapters 334 and 350. Petroleum (JP-8) contaminated waste shall be transported in accordance with 30 TAC Chapter 335.

1.6 PROJECT/SITE CONDITIONS

The hydrant fueling pits and valve boxes are constructed of steel. The hydrant fueling system have been used for conveying jet fuel (JP-8) and is currently in-service or abandoned in place.

Some hydrant fuel pits and valve boxes are infiltrated by storm water and are potentially contaminated with small amount of dripped fuel from the fueling process. Liquid pumped from the hydrant fuel pits, valve boxes and manholes, etc. and wastewater from purging fuel lines (and other parts of the hydrant fueling system) is considered a petroleum contaminated waste.

Subsurface conditions are shown on the boring logs for this project (see project index of drawing for sheet number). Existing native soils are predominantly dark grayish brown clay loam at the top 7 inches (approx.) of depth and the subsoil at 22 inches (approx.) is grayish brown clay loam containing calcium carbonate concentrations and shale fragments. Groundwater is not expected to be encountered. The Contractor shall verify the actual conditions prior to submitting a bid. The site is not a hazardous waste site but shall be given special consideration due to the nature of the materials and potential hazards until activities in this section are complete.

If contaminated soil is identified, petroleum contaminated soil of less than 1500 ppm (mg/Kg) shall be disposed of at the Fort Hood Landfill. If contaminated soil is 1500 ppm and above, the Fort Hood Bio-Facility shall be utilized to remediate soil to a level until it is acceptable to Fort Hood Landfill.

1.6.1 Sequencing and Scheduling

The Contractor shall notify the COR 21 working days prior to start work (and DPW-Environmental shall be notified by COR). If contamination is identified after testing of excavated soil, water and soil in the excavation, reporting and recordkeeping shall be required in accordance with TAC Chapters 334 and 350. Contamination shall be notified as described in PART I GENERAL.

1.6.2 Work Plan

The Contractor shall develop, implement, maintain, and supervise as part of the work, a comprehensive plan for work described in PART I, GENERAL. As a minimum the plan shall include, but not be limited to, excavation and stockpiling; purging, cleaning of fuel lines; pumping liquid and cleaning of hydrant fueling pits, valve boxes, manholes, and etc.; removal of existing hydrant fueling system; examination, testing,ultimate disposal of the hydrant fueling system, and contaminated materials. The Work Plan shall be based on work experience, on the requirements of this specification, and on the following references:

a. API RP 1604.

b. API Std 2015.

c. API RP 2003.

d. API Publ 2217A.

e. API Publ 2219.

e. TAC Chapters 334, 335 and 350.

No work at the site, with the exception of site inspections and mobilization, shall be performed until the Work Plan is approved. At a minimum, the Work Plan shall include:

a. Discussion of the removal approach, purging, cleaning, dismantling and cutting procedures.

b. A Sampling and Analysis Plan prepared in accordance with Section: 01450 CHEMICAL DATA QUALITY CONTROL.

c. Methods to be employed for product, sludge, vapor, and pumpable liquid removal; purging and inerting; and storage methods proposed

for control of surface water.

d. Identification of waste; pipes (fueling pits and valve boxes) and contaminated water and soil; transporters; and means of transportation.

e. Method of ultimate disposal.

f. Borrow source (reference civil drawings).

g. Spill prevention plan.

h. Spill contingency plan.

i. Decontamination procedures, shoring plan, and safety measures in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

j. Type of structural controls to be used around the excavated trenches and stockpiles.

PART 2 PRODUCTS

2.1 BACKFILL

Non-contaminated material removed from the excavation shall be used for backfill in accordance with Section 02316 - EXCAVATION, TRENCHING, BACKFILLING FOR UTILITIES SYSTEMS.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Safety Guidelines

Personnel shall abide by the safety guidelines specified in Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.1.2 Burning and Explosives

Use of explosives or burning debris will not be allowed.

3.1.3 Protection of Existing Structures and Utilities

The Contractor shall take all necessary precautions to avoid damage to existing structures, their appurtenances or utilities that may be affected by work activities. Any damage to utilities resulting from the Contractor's operations shall be repaired at no expense to the Government. The Contractor shall review the civil, electrical, and mechanical demolition drawings and be familiar with the project requirement. If needed to, perform site visit prior to work to verify conditions. Utilities encountered which were not previously shown or otherwise located shall not be disturbed without approval from the Contracting Officer.

3.1.4 Shoring

SHORING PLAN required shall be submitted under WORK PLAN in this section.

3.2 CONTENTS VERIFICATION

Sampling and analysis shall be conducted in accordance with the approved Sampling and Analysis Plan in Section 01450 CHEMICAL DATA QUALITY CONTROL.

3.2.1 Sampling and Analysis

Sampling required for work in this section shall be performed by the Contractor in accordance with the Evaluation of Solid Waste, Physical/Chemical Method (EPA SW 846) and Method for Chemical Analysis of Water and Waste (EPA Method 600 series) per 30 TAC Chapters 334, and applicable requirements per 30 TAC Chapters 335, and 350. If the data for disposal is not adequate, additional sampling and analysis to the extent required by the approved permitted treatment, storage or disposal (TSD) facility receiving the material shall be the responsibility of the Contractor. Meeting all regulatory requirements, including the preparation of hazardous materials and waste for transportation shall be the responsibility of the Contractor.
Based on the knowledge of the site, the Contractor shall coordinate analytical parameters requirements with the TSD facility. The sampling and analyses required shall be stated in the Work Plan

3.2.2 Not Used

3.2.3 Characterization

Contaminated water, pumpable liquids, and sludge shall be characterized in accordance with 40 CFR 261, 40 CFR 279, and 30 TAC Chapters 335 and any additional requirements identified by the disposal facility. The waste contents determination and accompanying test results shall be submitted to the COR. The characterized materials shall not be removed until approval is given by the COR.

3.3 DEMOLITION

Demolition at the airfield apron shall be in accordance with and Section 02220 - DEMOLITION.

3.4 Not Used

3.5 PREPARATIONS FOR EXCAVATION

Before excavation, the Contractor shall remove usable fuel or product in fuel lines to retrievable containers and turn-in to DPW-Supply. Liquids in hydrant pits and valve boxes and manholes shall be pumped. Fuel lines shall be purged and inerted. All items of the hydrant fueling system shall cleaned prior to removal.

3.5.1 Contaminated Liquids and Sludge

Contaminated liquids and sludge shall be tested, manifested and disposed in accordance with local and state regulations. Pumpable liquids and sludge shall be analyzed and segregated to recover reusable products by the Contractor prior to being transported to the treatment, storage and disposal (TSD) facility. Pumpable liquids and sludge shall be removed and disposed of by the Contractor. No Government facilities shall be used for permanent storage or disposal of the wastes. Temporary storage on Government facilities will be allowed only until testing is complete, manifests (if necessary) are complete, and transportation is arranged. Location of storage shall be approved by the COR. The Contractor shall be responsible for obtaining all required permits. Recovered product shall be the property of the Contractor. The Contractor shall provide approved containers, vehicles, equipment, labor, signs, labels, placards and manifests and associated land disposal restriction notices and notifications, necessary for accomplishment of the work, including materials necessary for cleaning up spills that could occur from various

activities.

3.5.2 Testing and Disposal of Water in Excavation

3.5.2.1 Sampling and Analysis

Water produced from excavation activities shall be analyzed. The parameters of analyses shall be submittd in the WORK PLAN, and shall be in accordance with the Evaluation of Solid Waste, Physical/Chemical Method (EPA SW 846) and Method for Chemical Analysis of Water and Waste (EPA Method 600 series) per 30 TAC Chapter 334, and applicable analytical procedures in 30 TAC Chapters 335, 350 (Texas Risk Reduction Program, TNRCC). The Contractor shall coordinate with a TSD facility for contaminated water to be taken to an off-site treatment facility. The test parameters shall conform to the requirements of the treatment and disposal facility. Documentation of all analyses performed shall be furnished to the COR in accordance with paragraph RECORDS. Contaminated water shall be transported to the approved treatment, storage and disposal facility and disposed of by the Contractor in accordance with applicable Federal, state, and local disposal regulations. Uncontaminated water shall be disposed of on-base (see PART I GENERAL.) The Contractor shall provide approved containers, vehicles, equipment, labor, signs, labels, placards and manifests and associated land disposal (if needed) notices and notifications, necessary for accomplishment of the work. Sampling and analyses shall be in accordance with Section 01450 CHEMICAL DATA QUALITY CONTROL.

3.5.2.2 Not Used

3.6 PURGING AND INERTING

Flammable and toxic vapors shall be purged from the fuel lines and made inert in accordance with API RP 1604, with the exceptions that filling with water shall not be used and, if dry ice is employed, the Contractor shall use a minimum of 3 pounds per 100 gallons of fuel pipe volume. The pipe atmosphere shall be continuously monitored for combustible vapors if the fuel pipes are purged, or continuously monitored for oxygen if the pipes are inerted. Reference Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.7 EXCAVATION

Excavation areas, as well as work near roadways, shall be marked in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.7.1 Not Used

3.7.2 Pipe Excavation

Excavation around the fuel lines, hydrant fueling pits, valve boxes and manholes, etc. shall be performed limiting the amount of potentially petroleum contaminated soil that could be mixed with previously uncontaminated soil. Petroleum contaminated soil shall be segregated in separate stockpiles. The Contractor shall maintain around the hydrant fueling system an excavation of sufficient size to allow workers ample room to complete the work, but also protect the workers from sliding or cave-ins. Sheeting, bracing, or shoring shall be installed in the absence of adequate side slopes if there is a need for workers to enter the excavated area. Surface water shall be diverted to prevent direct entry into the excavation. Dewatering of the excavation shall be limited to allow adequate access to the existing hydrant fueling system (see PART I GENERAL), to assure a safe excavation, and to ensure that compaction and moisture requirements are met during backfilling. Dewatering may result in

the production of petroleum contaminated water and/or free product. Free product shall be recovered by the Contractor.

3.7.3 Piping Excavation

Excavation shall be performed as necessary to remove fuel lines, hydrant fueling pits, valve boxes, and ancillary equipment in accordance with paragraphs 3.7.4 Open Excavations.

3.7.4 Open Excavations

Open excavations and stockpile areas shall be secured while awaiting confirmation test results from the soil beneath the hydrant fueling system. The excavation shall be backfilled (under Section 02316) as soon as possible after the existing hydrant fueling system and contaminated soil are removed, confirmation samples results are available, flushed water from new hydrant fueling system is tested, necessary grading (required by new work under other sections), and work necessary as approved by COR. The Contractor shall divert surface water around excavations to prevent water from directly entering into the excavation. If contaminated soil is identified, The Contractor shall stop work and notify the COR immediately. If site investigation and remediation is directed, it shall be performed in accordance with 30 TAC Chapter 350.

3.7.5 Stockpiles

Stockpile locations shall be approved by COR. Uncontaminated excavated soil shall be used for backfill. Excavated material that is regulated by the state as a petroleum contaminated waste or which is visibly stained and which has an obvious petroleum odor, shall be considered contaminated and shall be placed in separate stockpile for sampling in accordance with paragraphs Stockpiled Material Sampling and Analysis. Uncontaminated soil shall be stockpiled separately from the contaminated soil, a safe distance away from, but adjacent to, the excavation. Allowable stockpiles of contaminated soil shall be placed on an impermeable geomembrane a minimum of 3 layers, each 30 mils thick, and covered with a 6 mils sheet of geomembrane. Structural controls (to be specified in the WORK PLAN for approval) shall be established around the stockpile materials to prevent sediment from contacting the storm runoff. The geomembrane shall be placed to prevent the stockpiled soil from coming into contact with surface water run-off.

3.8 REMOVAL OF HYDRANT FUELING SYSTEM

3.8.1 Fuel Lines, Hydrant Fueling Pits and Valve Boxes

After interior cleaning, the exterior of all items removed shall be cleaned to remove all soil and inspected for signs of corrosion and leakage. The Contractor shall ensure no spillage of the piping contents occurs, as specified in the Work Plan, and as required in paragraph 3.13 SPILLS. All materials coming into contact with the hydrant fueling system, or in the vicinity of the excavation, such renovated items as shovels, slings and tools, shall be of the non-sparking type. After removal from the excavation, they shall be placed on a level surface at an approved location, and secured with wood blocks to prevent movement.

3.8.2 Not Used

3.8.3 Excavation Examination

After items are removed from the ground, the adjacent and underlying soil shall be examined for any evidence of leakage. The soil shall be visually

inspected for staining after removal of all obviously contaminated soil, then screened for the presence of volatile and/or semi-volatile contamination using a real time vapor monitoring instrument or immunoassay field kit. Uncontaminated soil shall be stockpiled on site per paragraph Stockpiles. Contaminated soil or suspected contaminated soil shall be stockpiled until COR approval for further disposition. If directed, the Contractor shall assist the COR to determine the extent of the contaminated soil to be removed. The Contractor shall report any evidence indicating that the amount of contaminated soil to the COR on the same day it is discovered. If minimal additional excavation is required, the COR may allow the Contractor to proceed. After contaminated soil is removed, the excavation shall be sampled and analyzed in accordance with Sampling and Analysis Plan approved in Section 01450 CHEMICAL DATA QUALITY CONTROL.

3.9 CLEANING

3.9.1 Exterior

Soil shall be removed from the exterior of each items in the hydrant fueling system to eliminate soil deposition on roadways during transportation, ensure markings will adhere to the surfaces. Soil shall be removed using non-sparking tools. Removed uncontaminated soil shall be recovered and used as backfill. Soil believed to be contaminated shall be removed and placed on 3 layers of 6 mil impermeable geomembrane and stockpiled with other contaminated soil removed from the excavation.

3.9.2 Not Used

3.9.3 Interior

The fuel pipes interior, hydrant fueling pits, valve boxes, manholes, etc. shall be cleaned using a high pressure (greater than 500 psi), low volume (less than 2 gpm) water spray until all loose scale and sludge is removed, and contamination, in the form of a sheen, is no longer visible in the effluent stream. Contaminated water generated from interior cleaning operations (of all items) shall not exceed 5 % volume of the item that required cleaning. The Contractor shall estimate volume of contaminated water generated from this task in the WORK PLAN.

All contaminated water resulting from cleaning operations shall be collected and stored on site and handled in accordance with paragraph 3.2 CONTENTS VERIFICATION. Cleaning shall be accomplished eliminating, to the greatest extent possible, the need for personnel to enter the hydrant fueling pits, valve boxes or manholes, etc. Cleaning shall be done using specially designed cleaning equipment which allows the pits or valve boxes to be cleaned without requiring personnel to enter the pits or valve boxes. The Contractor shall coordinate with the COR for the confined space entry and submit PERMIT REQUIRED CONFINED SPACE PLAN for COR approval prior to entry (see Section 01351 - SAFETY, HEALTH, AND EMERGENCY RESPONSE).

3.10 SOIL EXAMINATION, TESTING, AND ANALYSIS

3.10.1 Excavation Sampling Procedures

After soil excavation is complete, the excavation shall be screened for contamination per paragraph 3.8.3 Excavation Examination. If contamination is suspected, sampled soil in the excavation with procedures, number, location, and methodology in accordance with the Evaluation of Solid Waste, Physical/Chemical Method (EPA SW 846) per 30 TAC Chapter 334, and applicable requirements in 30 TAC Chapters 335 and 350, the approved Sampling and Analysis Plan in Section 01450 CHEMICAL DATA QUALITY CONTROL. Sampling locations, number shall be submitted in WORK PLAN and meeting

specific disposal requirements of the TSD facility.

3.10.2 Stockpiled Material Sampling

Stockpiled soil shall be screened for contamination per paragraph 3.8.3 Excavation Examination. If contamination is suspected, sampled stockpiled material and preserved in accordance with the Evaluation of Solid Waste, Physical/Chemical Method (EPA SW 846) per 30 TAC Chapters 334, and applicable requirements per 30 TAC Chapters 335 and 350, the approved Sampling and Analysis Plan in Section 01450 CHEMICAL DATA QUALITY CONTROL. Sampling locations, number shall be submitted in WORK PLAN and meeting specific disposal requirements of the TSD facility.

3.10.3 Analysis

Soil samples from the excavation and stockpiled material shall be tested in accordance with the approved Sampling and Analysis Plan in Section 01450 CHEMICAL DATA QUALITY CONTROL, and in accordance with Evaluation of Solid Waste, Physical/Chemical Method (EPA SW-846) per 30 TAC Chapters 334. Copies of all test results shall be provided to the COR.

3.11 BACKFILLING

The excavations shall be backfilled after approval of COR in accordance with Section 02316. Backfill consisting of clean fill shall be placed in layers with a maximum loose thickness of 8 inches, and compacted to 90 percent maximum density for cohesive soils and 95 percent maximum density for cohesionless soils. Density tests shall be performed by an approved commercial testing laboratory or by facilities furnished by the Contractor. Test results shall be attached to contractor's Quality Control Report. A minimum of 1 density test shall be performed on each lift. Laboratory tests for moisture density relations shall be determined in accordance with ASTM D 1557, Method B, C, or D, or ASTM D 3017. A mechanical tamper may be used provided that the results are correlated with those obtained by the hand tamper. Field in-place density shall be determined in accordance with ASTM D 1556, ASTM D 2922, or ASTM D 2167.

3.12 DISPOSAL REQUIREMENTS

3.12.1 Treatment, Disposal, and Recycling

Disposal of fuel (JP-8) contaminated wastes shall be in accordance with all local, current State of Texas regulations (TAC Chapters 334, 335 and 350), and applicable Federal solid and hazardous waste laws and regulations; and conditions specified herein. This work shall include all necessary personnel, labor, transportation, packaging, detailed analyses (if required for disposal, manifesting or completing waste profile sheets), equipment, and reports. Product and pumpable liquids removed shall be recycled to the greatest extent practicable by the Contractor. The metallic components of the hydrant fueling system removed shall be disposed of at a state approved scrap metal facility. Final disposition document or manifest, as required by the current State of Texas regulations (30 TAC Chapters 334 and 335) and acceptance at the disposal facility, shall be submitted to the COR.

3.12.2 Not Used

3.12.3 Transportation of Wastes

Transportation shall be provided in accordance with Department of Transportation (DOT) Hazardous Material Regulations, the current State of Texas regulations (30 TAC Chapters 334 and 335), local requirements, including obtaining all necessary permits, licenses, and approvals. A copy

of hauler permit from a state licensed waste transporter shall be included in the SUBMITTALS.

3.12.4 Salvage Rights

The Contractor shall retain the rights to salvage value of recycled or reclaimed product, so long as the requirements of 40 CFR 266, 40 CFR 279 and 30 TAC Chapters 334, 335, and 350, or the applicable State requirements are met. At the end of the contract, the Contractor shall provide documentation on the disposition of salvaged materials.

3.12.5 Records

Records shall be maintained of all waste determinations, including appropriate results of analyses performed, substances and sample location, the time of collection, and other pertinent data as required by 40 CFR 280, Section 74 and 40 CFR 262 Subpart D, 30 TAC Chapters 334, 335, 350, and Section 01450 CHEMICAL DATA QUALITY CONTROL. Transportation, treatment, disposal methods and dates, the quantities of waste, the names and addresses of each transporter and the disposal or reclamation facility, shall also be recorded and available for inspection, as well as copies of the following documents:

a. Manifests.

b. Waste analyses or waste profile sheets.

c. Certifications of final treatment/disposal signed by the authorized disposal facility official.

d. Land disposal notification records required under 40 CFR 268 for hazardous wastes.

Records shall be provided in accordance with the current State of Texas regulations, 30 TAC Chapters 334 and 350. Following contract close out, the records shall become the property of the Government.

3.12.6 Waste Manifests

Manifesting shall conform to the requirements specified in the current State of Texas regulations, 30 TAC Chapters 335 and 350.

3.12.7 Documentation of Treatment or Disposal

The wastes, other than recyclable or reclaimable product or metal, shall be taken to a treatment, storage, or disposal facility which has EPA or appropriate state permits and waste identification numbers and complies with the provisions of the disposal regulations. Documentation of acceptance of waste by the original return copy of the waste manifest, signed by the owner or operator of a facility legally permitted to treat or dispose of those materials shall be furnished to the COR not later than 5 working days following the delivery of those materials to the facility; and a copy shall be included in the Hydrant Fueling System Closure Report. A statement of agreement from the proposed treatment, storage or disposal facility and certified transporters to accept fuel (JP-8) contaminated wastes shall be furnished in the Work Plan to the COR not less than 14 days before transporting any wastes. If the Contractor selects a different facility than is identified in the contract Work Plan, documentation shall be provided for approval to certify that the facility is authorized and meets the standards specified in 40 CFR 264.

3.13 SPILLS

Immediate containment actions shall be taken as necessary to minimize effect of any spill or leak. Cleanup shall be in accordance with applicable Federal, State, local laws and regulations, and district policy at no additional cost to the Government. Spill response and reporting requirements shall be in accordance with the current state regulations, and the approved WORK PLAN

3.14 HYDRANT FUELING SYSTEMS CLOSURE REPORT

Closure Reports shall include the following information as a minimum:

a. A cover letter signed by a responsible company official or a Professional Engineer registered in the State of Texas certifying that all services involved have been performed in accordance with the terms and conditions of this specification.

b. A narrative report describing what was encountered at each location, including:

(1) condition of the fuel lines, hydrant fueling pits, valve boxes, manholes, etc.

(2) any visible evidence of leaks or stained soils.

(3) results of vapor monitoring readings or immunoassay kit.

(4) actions taken including quantities of materials treated or removed.

(5) reasons for selecting sample locations.

(6) sample locations.

(7) collection data such as time of collection and method of preservation shall be in accordance with Evaluation of Solid Waste, Physical/Chemical Method (EPA SW-846) and the types of parameter being analyzed. It shall be in accordance with applicable current state regulations in TAC Chapters 334 and 350.

(8) whether or not groundwater was encountered.

(9) Using a site drawing to indicate sample locations.

c. Copies of all analyses performed for disposal.

d. Copies of all waste analyses or waste profile sheets.

e. Copies of all certifications of final disposal signed by the authorized disposal installation official.

f. Information on who sampled, analyzed, transported, and accepted all wastes encountered, including copies of manifests, waste profile sheets, land disposal restriction, notification and certification forms, certificates of disposal, and other pertinent documentation.

g. Copies of all analyses performed for confirmation that underlying soil is not contaminated, with copies of chain-of-custody for each sample. Analyses shall give the identification number of the sample used. Sample identification numbers shall correspond to those provided on the one-line drawings.

h. Scaled one-line drawings showing tank locations, limits of excavation, limits of contamination, underground utilities within 50 feet, sample locations, and sample identification numbers.

i. Progress Photographs. The Contractor shall take views of the site showing, as a minimum, location of sampled site, entrance/exit road, and any other notable site conditions before work begins. After work has been started at the site, the Contractor shall photographically record progress of activities. Photographs shall be 3 x 5 inches and shall include:

(1) Soil removal, handling, and sampling.

(2) Unanticipated events such as discovery of additional contaminated areas.

(3) Soil stockpile area.

(4) Demolished fuel lines, hydrant fueling pits and pipes; valve boxes and manholes, ect.

(5) Site or task-specific employee respiratory and personal protection.

INFORMATION ON PHOTOS

Project No. Contract No.

Location
Contractor/Photographer

Photograph No. Date/Time:

Description

Direction of View

-- End of Section --

SECTION 02220

DEMOLITION
05/02
Amendment No. 0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.6	(1990) Safety Requirements for Demolition Operations

AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)

ARI Guideline K	(1997) Containers for Recovered Fluorocarbon Refrigerants

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 82	Protection of Stratospheric Ozone; Refrigerant Recycling
49 CFR 173.301	Shipment of Compressed Gas Cylinders

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(June 2000) Storage and Handling of Liquefied and Compressed Gases and Their Full and Empty Cylinders

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	Requisitioning and Issue Procedures
MIL-STD-129	(Rev. N) Marking for Shipment and Storage

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

Do not begin demolition until authorization is received from the Contracting Officer. The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections. In the interest of

conservation, salvage shall be pursued to the maximum extent possible (in accordance with Section 01572 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, if applicable; salvaged items and materials shall be disposed of as specified.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Notification to TDH; G

Notification of building demolition activity, signed by the Contractor, shall be provided to the Texas Department of Health (TDH) no later than 10 days before demolition of any structure. The Contractor shall submit a receipt of proof of notification to the Contracting Officer.

SD-03 Product Data

Work Plan; G,

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1. Perform an asbestos inspection and report the results to the installation representative prior to demolition activities.

SD-07 Certificates

Demolition plan; G

Notifications; G

Notification of Demolition and Renovation forms; G

Submit proposed demolition and removal procedures to the Contracting Officer for approval before work is started.

SD-11 Closeout Submittals

Receipts

1.4 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," safety requirements shall conform with ANSI A10.6.

1.4.1 Notifications

Furnish timely notification of demolition and renovation projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61-SUBPART M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA) State's environmental protection agency local air pollution control district/agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61-SUBPART M.

Complete and submit Notification of Demolition and Renovation forms to Federal and State authorities and Contracting Officer, postmarked or delievered at least ten working days prior to commencement of work, in accordance with 40 CFR 61-SUBPART M. Complete paragraphs I, II, III.B, III.C (if applicable), VIII, and IX thru XIX of form. Copy of form is attached at end of this section.

1.4.2 Receipts

Submit a shipping receipt or bill of lading for all containers of ozone depleting substance (ODS) shipped to the Defense Depot, Richmond, Virginia.

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to occupied portions of the building on airfield pavements and avoid the creation of a nuisance or hazard in the surrounding area. Apply water during removal of asbestos-laden materials as required to control the spread of dust and debris. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

1.6 PROTECTION

1.6.1 Traffic Control Signs

Where aircraft safety is endangered in the area of removal work, use traffic barricades with flashing lights. Anchor barricades in a manner to prevent displacement by jet or prop blast. Notify the Contracting Officer prior to beginning such work.

1.6.2 Existing Work

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement must have Contracting Officer approval.

1.6.3 Weather Protection

For portions of the building to remain, protect building interior and materials and equipment from the weather at all times. Where removal of

existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas so as to ensure effectiveness and to prevent displacement.

1.6.4 Trees

Trees within the project site which might be damaged during demolition, and which are indicated to be left in place, shall be protected by ahigh fence. The fence shall be securely erected a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Contracting Officer.

1.6.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, of lateral support until demolished, unless directed otherwise by the Contracting Officer. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.6.6 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area. All personnel shall wear appropriate masks, eye and body protection for protection against falling debris and hazardous materials.

1.6.7 **1.6.7 Surrounding Buildings (Am#1)**

Before beginning any demolition work, the contractor shall survey the site to determine the extent of the work. The contractor shall develop a plan to avoid damage to all surrounding buildings and its occupants; any building damage shall be repaired or replaced as approved by the Contracting Officer.

1.7 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.8 FOREIGN OBJECT DAMAGE (FOD)

Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's

operations. If necessary, the Contracting Officer may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall consist of a fence covered with a fabric designed to stop the spread of debris; anchor the fence and fabric to prevent displacement by winds or jet/prop blasts. Remove barricade when no longer required.

1.9 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the Contracting Officer.

1.10 Required Data

Demolition plan shall include procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, and airfield lighting, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Include statements affirming Contractor inspection of the existing roof deck and its suitability to perform as a safe working platform or if inspection reveals a safety hazard to workers, state provisions for securing the safety of the workers throughout the performance of the work.

1.11 Environmental Protection

The work shall comply with the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

1.12 USE OF EXPLOSIVES

Use of explosives will not be permitted.

1.13 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

a. Bldg #90050 is available for demolition 60 days after contract notice to proceed is signed by the Contractor.

b. Bldg #90049 shall be available for demolition 60 days after government acceptance of the new Base Operations Building.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

3.1.1 Structures

Existing structures indicated shall be removed to 1 feet below grade or lowest level. Interior walls, other than retaining walls and partitions, shall be removed to 2 feet below grade or to top of concrete slab on ground. Basement slabs shall be broken up to permit drainage. Sidewalks, curbs, gutters and street light bases shall be removed as indicated.

3.1.2 Utilities and Related Equipment

Remove existing utilities and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer. If utility lines are encountered that are not shown on drawings, contact the Contracting Officer for further instructions.

3.1.3 Paving and Slabs

Remove sawcut concrete and asphaltic concrete paving and slabs as indicated to a depth of [_____] inches below new finish grade. Provide neat sawcuts at limits of pavement removal as indicated.

3.1.4 Roofing

Remove existing corrugated roof panels and associated components in their entirety down to existing perlins on the existing Pallet Warehouse building and replace with new composite roof panels as indicated. Sequence work to minimize building exposure between demolition and new roof materials installation. Install temporary roofing and flashing as necessary to maintain a watertight condition throughout the course of the work. Remove temporary work prior to installation of permanent roof system materials unless approved otherwise by the Contracting Officer. If the existing deck and support structure are deteriorated, such that ability to support foot traffic and construction loads is unknown then make provisions for worker safety during demolition and installation of new materials as described in paragraphs entitled "Statements" and "Regulatory and Safety Requirements." Sequence the work to minimize hazard to workers. Identify all asbestos-laden materials prior to demolition activities and dispose of per work plan approved by the installation representative.

3.1.4.1 Reroofing

When removing the existing roofing system from the roof deck, remove only as much roofing as can be recovered by the end of the work day, unless

approved otherwise by the Contracting Officer. No opening in the roof cover shall be attempted in threatening weather and any opening made shall be resealed prior to suspension of work the same day.

3.1.5 Masonry

Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as indicated.

3.1.6 Concrete

Saw concrete along straight lines to a depth of not less than 2 inches. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.

3.1.7 Airfield Lighting

Remove existing airfield lighting as indicated and terminate in a manner satisfactory to the Contracting Officer. Remove edge lights, as indicated and deliver to a location on the station in accordance with instructions of the Contracting Officer.

3.1.8 Patching

Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

a. Holes and depressions caused by previous physical damage or left as a result of removals in existing masonry walls to remain shall be completely filled with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

b. Where existing partitions have been removed leaving damaged or missing resilient tile flooring, patch to match the existing floor tile.

c. Patch acoustic lay-in ceiling where partitions have been removed. The transition between the different ceiling heights shall be effected by continuing the higher ceiling level over to the first runner on the lower ceiling and closing the vertical opening with a painted sheet metal strip.

3.1.9 Air Conditioning Equipment

Remove air conditioning equipment without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990.Recover all refrigerants prior to removing air conditioning equipment and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)." Turn in salvaged Class I ODS refrigerants as specified in paragraph, "Salvaged Materials and Equipment."

3.1.10 Cylinders and Canisters

Remove all fire suppression system cylinders and canisters and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)."

3.1.11 Locksets on Swinging Doors

The Contractor shall remove all locksets from all swinging doors indicated to be removed and disposed of. Contractor shall give the locksets to the Contracting Officer after their removal.

3.2 FILLING

Holes, open basements and other hazardous openings shall be filled in accordance with Section 2300A Earthwork.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materialsials

Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.3.2 Reuse of Materials and Equipment

No materials or equipment will be re-used.

3.3.3 Salvaged Materials and Equipment

Contractor shall salvage items and material to the maximum extent possible.

Material salvaged for the Contractor shall be stored as approved by the Contracting Officer and shall be removed from Government property before completion of the contract. Material salvaged for the Contractor shall not be sold on the site.

Salvaged items to remain the property of the Government shall be removed in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage shall be repaired or replaced to match existing items. Containers shall be properly identified as to contents.

Historical items shall be removed in a manner to prevent damage. The following historical items shall be delivered to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.

3.3.4 Debris Disposal in the Ft. Hood Area

Landfill coupons, that permit waste disposal at the Ft. Hood Landfill free of charge, are available from the Contracting Officer. The coupons will be issued only upon the submission of a written request, by the prime

contractor to the ROICC, which must identify the nature of the waste and the number of coupons requested. The landfill coupons issued under this contract are to be used only for the disposal of waste generated by this contract. If the prime contractor, one of its subcontractors, or one of its waste haulers is found to be misusing the landfill coupons by disposing of waste not generated under this contract, all rights under the contract to use landfill coupons shall be forfeited, from the date of misuse forward. All unused coupons will be returned to the Contracting Officer and no additional coupons will be issued for the duration of the contract. The Contracting Officer's refusal to issue landfill coupons, because of prior misuse, is not a change to the contract and no adjustment of the contract price will be made.

3.3.5 Disposal of Ozone Depleting Substance (ODS)

Class I and Class II ODS are defined in Section, 602(a) and (b), of The Clean Air Act. Prevent discharge of Class I and Class II ODS to the atmosphere. Place recovered ODS in cylinders meeting ARI Guideline K suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. Recovered ODS shall be remove from Government property and dispose of in accordance with 40 CFR 82. Products, equipment and appliances containing ODS in a sealed, self-contained system (e.g. residential refrigerators and window air conditioners) shall be disposed of in accordance with 40 CFR 82.

3.3.5.1 Special Instructions

Each container shall have in it no more than one type of ODS. A warning/hazardous label shall be applied to the containers in accordance with Department of Transportation regulations. All cylinders including but not limited to fire extinguishers, spheres, or canisters containing an ODS shall have a tag with the following information:

a. Activity name and unit identification code

b. Activity point of contact and phone number

c. Type of ODS and pounds of ODS contained

d. Date of shipment

3.3.5.2 Fire Suppression Containers

Fire suppression system cylinders and canisters with electrical charges or initiators shall be deactivated prior to shipment. Also, safety caps shall be used to cover exposed actuation mechanisms and discharge ports on these special cylinders.

3.3.6 Transportation Guidance

Shipment of all ODS containers shall be in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, 49 CFR 173.301, and DOD 4000.25-1-M.

3.3.7 Unsalvageable Material

The Fort hood Landfill may be used to dispose of Class 2 waste and non-friable asbestos (category 1. and 2.). Friable asbestos, light bulbs, mercury switches, thermostats, valances, and power poles containing cerosoak shall be treated as hazardous material, and shall not be disposed of in the Ft. Hood Landfill. Metal can not be disposed of in the Ft. Hood Landfill. Broken up asphalt, concrete and masonry (containing no exposed

feinforcing steel), and other noncombustible material, except concrete permitted to remain in place, shall be disposed of after completely separating from other material in the disposal area located at the inert materials pile next to the Ft. Hood Landfill, as shown on the project location map and on the drawings. All items to be demolished, which can not be dipsposed of in the Ft. Hood Landfill shall be disposed of off government controlled property, at the expense and responsibility of the contractor. See Specification 01368 fo Ft. Hood Landfill requirements and procedures.

3.4 CLEANUP

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.4.1 Debris and Rubbish

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

-- End of Section --

SECTION 02222

AIRFIELD PAVEMENT REMOVALS
03/2002
AMENDMENT #0001

PART 1 GENERAL

1.1 SUMMARY (NOT APPLICABLE)

1.2 REFERENCES (NOT APPLICABLE)

1.3 GENERAL REQUIREMENTS

The work includes demolition of Portland cement concrete, and asphalt cement concrete airfield pavement, and the removal of the resulting pavement material off Government property, or the option to dispose of the pavement material in a designated area. Pavement removal material shall not be stockpiled on the runway, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plan; G, ___.

Furnish a work plan.

1.5 WORK PLAN

Propose and detail procedures for accomplishing the work. The procedures shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, and coordination with other work in progress, and timely disconnection of utility services. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations. The work plan shall also identify all off-site waste disposal facilities and include appropriate documentation.

1.6 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

1.7 PROTECTION

1.7.1 Protection of Existing Property

Before beginning any demolition work, the Contractor shall carefully survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government, and any damaged items shall be repaired or replaced as approved by the Contracting Officer at no additional cost to the Government. The Contractor shall carefully coordinate the work of this section with all other work and shall construct and maintain shoring, bracing and supports, as required. The Contractor shall ensure that utility components are not overloaded, and/or unsupported, and shall be responsible for adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.8 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.9 USE OF EXPLOSIVES

Use of explosives will not be permitted.

1.10 TEST SECTIONS

The Contractor shall demonstrate the method of removal as shown on the drawings upon initiation of the work. Any pavement beyond the limits of the removal area that is damaged by the Contractor's removal operations shall be removed and replaced at the Contractor's expense, using methods and materials specified under this contract.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 UTILITIES

Existing utilities shall be removed as indicated. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.

3.2 DISPOSITION OF MATERIAL

Title to materials and equipment to be demolished, excepting Government salvage and historical items, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.2.1 Salvageable Items and Materials

Contractor shall salvage items and materials to the maximum extent possible. [AM#1]At the Contractor's option, the removed flexible pavement may be processed for use as fill material for the Ammo Upload Road. Use of this option shall not relieve the Contractor from conforming to the quality requirements of the specified materials.

3.2.2 Unsalvageable Materials

Unsalvageable materials shall be classified as to the type of waste in accordance with federal, state, and local regulations and segregated prior

to disposal. Disposal of materials outside Government-controlled lands shall be in accordance with federal, state, and local regulations. The location of any disposal facility located outside the limit of Government-controlled lands for each type of waste shall be submitted to the Contracting Officer prior to removal from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the type of waste. No material shall be removed from the site without prior approval from the Contracting Officer.

3.3 CLEAN-UP

Debris and rubbish shall be removed from the site. Debris shall be removed and transported in a manner that prevents spillage on airfield pavements, streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.4 PAVEMENTS

Existing pavements designated for removal shall be removed to the limits and depths indicated on the drawings.

3.4.1 Existing Rigid Pavement

Where indicated on the drawings, the existing rigid pavement shall be removed and replaced. The existing rigid pavement slabs shall be removed from joint to joint with a double full-depth sawcut as shown on the drawings. Removal shall be accomplished which will not damage the adjacent concrete to remain or disturb the underlying granular base course materials. Upon completion of removal operations, the face of existing joints shall have clean, and sound, concrete exposed, and shall be essentially vertical. Any pavement beyond the limits of the removal area that is damaged by the Contractor's removal operations shall be removed and replaced by and at the Contractor's expense, using methods designated for rigid pavement removal and replacement under this contract.

3.4.2 Existing Flexible Pavement

Where flexible pavement removal is required on the drawings, flexible pavement removal shall be started by making a vertical sawcut at the location and depth indicated on the drawings. After completing the sawcut, the remainder of the flexible pavement removal shall be accomplished by approved methods without damaging existing flexible pavements that are to remain in place.

-- End of Section --

SECTION 02364

TERMITICIDE TREATMENT MEASURES FOR SUBTERRANEAN TERMITE CONTROL
AMENDMENT #0001

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Instructions

Termiticides; FIO.

Manufacturer's label and Material Safety Data Sheet (MSDS) for termiticides proposed for use.

SD-07 Schedules

Equipment; FIO.

A listing of equipment to be used.

SD-08 Statements

Foundation Exterior; FIO.

Written verification that other site work will not disturb the treatment.

Utilities and Vents; FIO.

Written verification that utilities, vents have been located.

Soil Moisture; FIO.

Soil moisture test result.

Verification of Measurement; FIO.

Written verification that the volume of termiticide used meets the application rate.

SD-09 Reports

Equipment Calibration and Tank Calibration; FIO.

Certification of calibration tests conducted on the equipment used in the termiticide application

SD-13 Certificates

Qualifications; FIO.

Qualifications and state license number of the termiticide applicator.

SD-14 Samples

Termiticides; FIO.

Termiticide samples obtained during application, upon request.

SD-18 Records

Termiticide Application Plan; FIO.

Termiticide application plan with proposed sequence of treatment work with dates and times. The termiticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area/volume treated, amount applied; and the name and state license number of the state certified applicator shall be included.

1.2 QUALIFICATIONS

The Contractor's principal business shall be pest control. The Contractor shall be licensed and the termiticide applicators certified in the state where the work is to be performed. Termiticide applicators shall also be certified in the U.S. Environmental Protection Agency (EPA) pesticide applicator category which includes structural pest control.

1.3 SAFETY REQUIREMENTS

The Contractor shall formulate, treat, and dispose of termiticides and their containers in accordance with label directions. Use the clothing and personal protective equipment specified on the labeling for use during all phases of the application.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

Termiticide material shall be delivered to the site in the original unopened containers bearing legible labels indicating the EPA registration number and manufacturer's registered uses. All other materials to be used on site for the purpose of termite control shall be delivered in new or otherwise good condition as supplied by the manufacturer or formulator.

1.4.2 Storage

Materials shall be stored in designated areas and in accordance with manufacturer's labels. Termiticides and related materials shall be kept under lock and key when unattended.

1.4.3 Handling

Termiticides shall be handled in accordance with manufacturer's labels. Manufacturer's warnings and precautions shall be observed. Materials shall be handled preventing contamination by dirt, water, and organic material. Protect termiticides from sunlight as recommended by the manufacturer.

1.5 INSPECTION

Termiticides shall be inspected upon arrival at the job site for conformity to type and quality in accordance with paragraph TERMITICIDE. Each label shall bear evidence of registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended. Other materials shall be inspected for conformance with specified requirements. Unacceptable

materials shall be removed from the job site.

1.6 WARRANTY

The Contractor shall provide a 5-year written warranty against infestations or reinfestations by subterranean termites of the buildings or building additions constructed under this contract. Warranty shall include annual inspections of the buildings or building additions.

PART 2 PRODUCTS

2.1 TERMITICIDES

Termiticides shall be currently registered by the EPA. Termiticide shall be selected for maximum effectiveness and duration after application. The selected termiticide shall be suitable for the soil and climatic conditions at the project site.

PART 3 EXECUTION

3.1 TECHNICAL REPRESENTATIVE

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for subterranean termites. They may be present during treatment application.

3.2 SITE PREPARATION

Site preparation shall be in accordance with Sections 02230 CLEARING AND GRUBBING, 02300 EARTHWORK, 02221 EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS, 02933 ESTABLISHMENT OF TURF and 02940 MULCHING FOR EROSION CONTROL. Work related to final grades, landscape plantings, foundations, or any other alterations to finished construction which might alter the condition of treated soils, shall be coordinated with this specification.

3.2.1 Ground Preparation

Food sources shall be eliminated by removing debris from clearing and grubbing and post construction wood scraps such as ground stakes, form boards, and scrap lumber from the site, before termiticide application begins.

3.2.2 Verification

Before work starts, the Contractor shall verify that final grades are as indicated and smooth grading has been completed in accordance with Section 02300 EARTHWORK. Soil particles shall be finely graded with particles no larger than 1 inch and compacted to eliminate soil movement to the greatest degree.

3.2.3 Foundation Exterior

The Contractor shall provide written verification that final grading and landscape planting operations will not disturb treatment of the soil on the exterior sides of foundation walls, grade beams, and similar structures.

3.2.4 Utilities and Vents

The Contractor shall provide written verification that the location and identity of HVAC ducts and vents, water and sewer lines, and plumbing have been accomplished prior to the termiticide application.

3.2.5 Crawl and Plenum Air Spaces

The Contractor shall provide written verification that the location and identity of crawl and plenum air spaces have been accomplished prior to the termiticide application.

3.3 SITE CONDITIONS

The following conditions shall determine the time of application.

3.3.1 Soil Moisture

Soils to be treated shall be tested immediately before application. Soil moisture content shall be tested to a minimum depth of 3 inches. The soil moisture shall be as recommended by the termiticide manufacturer. The termiticide will not be applied when soil moisture exceeds manufacturer's recommendations because termiticides do not adhere to the soil particles in saturated soils.

3.3.2 Runoff and Wind Drift

Termiticide shall not be applied during or immediately following heavy rains. Applications shall not be performed when conditions may cause runoff or create an environmental hazard. Applications shall not be performed when average wind speed exceeds 10 miles per hour. The termiticide shall not be allowed to enter water systems, aquifers, or endanger humans or animals.

3.3.2.1 Vapor Barriers and Waterproof Membranes

Termiticide shall be applied prior to placement of a vapor barrier or waterproof membrane.

3.3.2.2 Utilities and Vents

Prior to application, HVAC ducts and vents located in treatment area shall be turned off and blocked to protect people and animals from termiticide.

3.3.3 Placement of Concrete

Concrete covering treated soils shall be placed as soon as the termiticide has reached maximum penetration into the soil. Time for maximum penetration shall be as recommended by the manufacturer.

3.4 TERMITICIDE TREATMENT

3.4.1 Equipment Calibration and Tank Measurement

Immediately prior to commencement of termiticide application, calibration tests shall be conducted on the application equipment to be used and the application tank shall be measured to determine the volume and contents. These tests shall confirm that the application equipment is operating within the manufacturer's specifications and will meet the specified requirements. The Contractor shall provide written certification of the equipment calibration test results within 1 week of testing.

3.4.2 Mixing and Application

Formulating, mixing, and application shall be performed in the presence of the Contracting Officer or the technical representative. A closed system is recommended as it prevents the termiticide from coming into contact with

the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying termiticides shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.4.3 Treatment Method

For areas to be treated, the Contractor shall establish complete and unbroken vertical and/or horizontal soil poison barriers between the soil and all portions of the intended structure which may allow termite access to wood and wood related products. Application shall not be made to areas which serve as crawl spaces or for use as a plenum air space.

3.4.3.1 Surface Application

Surface application shall be used for establishing horizontal barriers. Surface applicants shall be applied as a coarse spray and provide uniform distribution over the soil surface. Termiticide shall penetrate a minimum of 1 inch into the soil, or as recommended by the manufacturer.

3.4.3.2 Rodding and Trenching

Rodding and trenching shall be used for establishing vertical soil barriers. Trenching shall be to the depth of the foundation footing. Width of trench shall be as recommended by the manufacturer, or as indicated. Rodding or other approved method may be implemented for saturating the base of the trench with termiticide. Immediately after termiticide has reached maximum penetration as recommended by the manufacturer, backfilling of the trench shall commence. Backfilling shall be in 6 inch rises or layers. Each rise shall be treated with termiticide.

3.4.4 Sampling

The Contracting Officer may draw from stocks at the job site, at any time and without prior notice, samples of the termiticides used to determine if the amount of active ingredient specified on the label is being applied.

3.5 VERIFICATION OF MEASUREMENT

Once termiticide application has been completed, tank contents shall be measured to determine the remaining volume. The total volume measurement of used contents for the application shall equal the established application rate for the project site conditions. The Contractor shall provide written verification of the measurements.

3.6 CLEAN UP, DISPOSAL, AND PROTECTION

Once application has been completed, the Contractor shall proceed with clean up and protection of the site without delay.

3.6.1 Clean Up

The site shall be cleaned of all material associated with the treatment measures, according to label instructions, and as indicated. Excess and waste material shall be removed and disposed off site.

3.6.2 Disposal of Termiticide

The Contractor shall dispose of residual termiticides and containers off Government property, and in accordance with label instructions and EPA

criteria.

3.6.3 Protection of Treated Area

Immediately after the application, the area shall be protected from other use by erecting barricades and providing signage as required or directed. Signage shall be in accordance with Section 10430 EXTERIOR SIGNAGE. Signage shall be placed inside the entrances to crawl spaces and shall identify the space as treated with termiticide and not safe for children and animals.

3.7 CONDITIONS FOR SATISFACTORY TREATMENT

3.7.1 Equipment Calibrations and Measurements

Where results from the equipment calibration and tank measurements tests are unsatisfactory, re-treatment will be required.

3.7.2 Testing

Should an analysis, performed by a third party, indicate that the samples of the applied termiticide contain less than the amount of active ingredient specified on the label, and/or if soils are treated to a depth less than specified or approved, re-treatment will be required.

3.7.3 Disturbance of Treated Soils

Soil and fill material disturbed after treatment shall be re-treated before placement of slabs or other covering structures.

3.7.4 Termites Found Within the Warranty Period

If live subterranean termite infestation or termite damage is discovered during the warranty period, the Contractor shall re-treat the site.

3.8 RE-TREATMENT

Where re-treatment is required, the Contractor shall:

a. Re-treat the soil and/or perform other treatment as necessary for prevention or elimination of subterranean termite infestation.

b. Repair damage caused by termite infestation.

-- End of Section --

SECTION 02466

DRILLED FOUNDATION CAISSONS (PIERS)

AM #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 615	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Drilled Foundation Caissons;

A certified copy of the survey. Lines and levels shall be established and caisson centerline locations staked and maintained by a registered surveyor provided by the Contractor.

Qualifications;

Qualifications of the Foundation System Contractor shall show that he has been engaged in the successful installation of drilled foundation caissons for at least 5 years.

SD-02 Shop Drawings

Drilled Foundation Caissons;

Detailed records in an approved form, for each caisson, showing shaft diameters, depths of test holes, top and bottom elevations, bearing strata description, casing description, water conditions, concrete strength, concrete volume, rock elevations, dates of excavation and concrete placement, and other pertinent information. Upon completion of caisson work, the Contractor shall provide a record of centerline locations based on the survey of the registered surveyor provided by the Contractor. In addition, corrective measures shall be similarly recorded. A complete tabulation of all records pertaining to approved caissons shall be delivered to the Contracting Officer.

1.3 QUALIFICATIONS

The work shall be performed by a specialty Contractor, specializing in the specified foundation system and having experience installing the specified foundation system under similar subsurface conditions.

1.4 SUBSURFACE DATA

Subsurface soil data logs are shown on the drawings. The subsurface investigation report of materials, as taken from subsurface investigations, are available for examination at the Fort Worth District Office.

1.5 MEASUREMENT AND PAYMENT

1.5.1 Drilled Piers

Drilled foundation piers will be measured by the linear foot for depth actually drilled in strict conformance to the requirements of the specifications and drawings. The length of drilled piers will be measured from the authorized bottom of the piers to their upper termination at the bottom of the grade beam, slab, pier cap, or any formed portion of the pier above grade, as applicable. Payment for drilled foundation piers will be made at the applicable contract unit price per linear foot according to diameter. This payment shall constitute full compensation for all plant, labor, materials, and all costs necessary for drilling, casing, and furnishing and placing steel and concrete, complete.

1.6 SUPERVISION, INSPECTION, AND SAFETY

1.6.1 Contractor Supervision

The Contractor shall provide for the supervision of all phases of drilled pier construction. Supervision shall be the Contractor's responsibility as outlined in Quality Control provisions of Section 01451 CONTRACTOR QUALITY CONTROL. Each drilled pier excavation shall be checked by the Contractor for its depth, water removal, cleanup, workmanship, and for all tolerance requirements before any concrete is placed.

1.6.2 Government Inspection

The Contracting Officer reserves the right to inspect each drilled pier excavation prior to placement of reinforcing steel and concrete. The Contractor shall furnish the Contracting Officer all necessary equipment required for proper inspection of drilled pier excavations. This inspection in no way relieves the Contractor of his responsibilities as outlined in CONTRACT CLAUSE "INSPECTION OF CONSTRUCTION."

1.6.3 Safety Precautions for Workmen and Inspectors

The Contractor shall provide and operate all equipment required by the Contracting Officer to allow visual inspection of pier excavations by workmen or the Government, including equipment for personnel entering the excavation. Sufficient approved equipment shall be maintained to raise and lower Contractor and Government personnel into the excavation whenever required. All such equipment and all procedures used for personnel entering pier excavations shall strictly comply with all requirements of the applicable safety manuals.

1.6.3.1 Life Line

Each person entering a drilled pier excavation shall be provided with a life line rigged so that the person can be immediately hoisted out of the excavation in an emergency. The life line shall be suitable for instant rescue, securely fastened to a shoulder harness, and separated from any line used to remove excavated materials. No person shall be lowered into a drilled pier excavation prior to casing the shaft through the overburden.

1.6.3.2 Ventilation

Each drilled pier excavation shall be provided with a ventilating device of sufficient capacity to assure a safe and healthy atmosphere before workmen and inspectors are permitted to enter the drilled pier excavation and during all work periods.

PART 2 PRODUCTS

2.1 CONCRETE WORK

Concrete work shall be in accordance with requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE, as modified herein:

2.1.1 Coarse Aggregate

Maximum size of coarse aggregate shall be 3/4 inch.

2.1.2 Reinforcing Steel

Reinforcing steel shall conform to ASTM A 615 Grade 60. Steel shall be tied into cages and inserted securely in the caissons, in position and alignment, as shown, prior to concrete placement.

2.1.3 Strength

Concrete strength shall be 3000 psi at 28 days. Slump shall be not less than 5 inches nor more than 7 inches. inches.Air content shall be 3-5%.

PART 3 EXECUTION

3.1 PREPARATION

a. Excavation of piers or groups of piers shall be performed so that the excavation and the placement of reinforcing steel and concrete are a continuous operation performed the same day that the excavation is started. Excavations shall not be left open overnight. Casings shall be on site prior to starting the drilling operation. Drilled piers shall be excavated to the depths and dimensions shown in the drawings. The bottoms of the pier excavation shall be cleaned of loose and disturbed materials or materials determined to be unsatisfactory for the required bearing pressure. Excavated material shall be disposed of in accordance with Section 02315A - EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS. Excavations below indicated depths, without specific direction by the Contracting officer, shall be filled with concrete at no cost to the Government. Where, in the opinion of the Contracting Officer, materials are encountered at the indicated depths that do not provide the required bearing capacity or would result in unsatisfactory construction, the excavation shall be extended as directed by the Contracting Officer. Payment for the additional excavation and pier

construction will be in accordance with PART 1 paragraph MEASUREMENT AND PAYMENT.

b. The drilling equipment shall be of suitable type and of sufficient size and capacity to satisfactorily perform the required drilling operations as specified or indicated. All equipment shall be subject to specific approval by the Contracting Officer and shall have a minimum torque of 50,000 foot pounds and a minimum crowd of 30,000 foot pounds. Any equipment which fails to perform satisfactorily shall be immediately modified as approved or removed and replaced.

3.2 INSTALLATION

a. During construction, the pier excavation shall be adequately and securely protected against cave-ins, displacement of the surrounding earth, and inflow of ground and surface water by means of temporary steel casings as required or as directed by the Contracting Officer. Casings shall have outside diameters not less than indicated shaft sizes, and shall be capable of sustaining loads imposed by installing, sealing, maintaining the excavated hole, and extracting. Casings shall be on site prior to starting the drilling operation. The casing shall have a minimum wall thickness of 1/4 inch. The ends of the casing shall not be damaged such that proper seating and sealing are impaired. Damaged casing shall be immediately repaired or removed from the site. Temporary steel casings shall be withdrawn, as the concrete is being placed, maintaining sufficient head of concrete within the casing to offset water table and to prevent extraneous material from falling in from the sides or entering from beneath casing and mixing with concrete. Casings may be jerked upward a maximum of 4 inches to break the bottom seal but shall thereafter be removed with a smooth, continuous motion. All voids surrounding the casing shall be filled with concrete extruded from the bottom of the casing as it is being raised, with all free water surrounding the casing being forced to the surface ahead of the rising concrete. Venting shall be provided if necessary to insure removal of water around the casing as the concrete level rises, and the casing is being removed. Driving of casings shall not be permitted within 20 feet of concrete placed within the preceding 3 days.

b. The inside of steel casings shall be thoroughly cleaned before being placed in a pier hole.

c. Pier holes shall be protected from inflow of ground or surface water. Water that flows into the excavations shall be continuously removed and the maximum permissible depth of water in the bottom of excavation will be 2 inches at the start of concrete placement. In the event that excessive water enters the hold, the excavation shall be deepened to undisturbed material immediately prior to concrete placement.

d. Concrete shall be placed in the pier hole within three hours after approval of the completed excavation. Concrete shall be continuously placed by methods that insure against segregation and dislodging of excavation sidewalls and shall completely fill the bell and shaft. Concrete shall be placed by pumps, tremie, or drop chutes. The discharge of pumping chute shall be kept a

minimum of 3 feet below the fresh concrete surface during placement.

e. Concrete shall be vibrated for not less than the upper 5 feet of pier.

f. Protection shall be provided around the top of the excavation to prevent debris and water from entering the excavation and concrete placed therein.

3.3 TOLERANCES

a. Any pier out of center or plumb beyond the tolerance specified shall be corrected as necessary to comply with the tolerances and the Contractor shall bear any cost of correction. Method of correction shall be approved by the Contracting Officer

b. Cross sections of shafts shall not be less than design dimensions. Cross sections of shafts shall not be greater than design dimensions plus 3 inches unless approved or directed by the Contracting Officer.

c. Location of the tops of installed piers shall not deviate from the centerline locations shown on the drawings more than 3 inches.

d. Vertical caissons shall be installed plumb within a maximum of 1-1/2 inches1-1/2 inches for the first 10 feet 10 feetand within 1/2 inch l/2 inchfor each 10 feet10 feet of additional depth.

e. The center of the pier will be established after construction is completed and the center marked by a suitable permanent mark.

3.4 PROTECTION

Provide protection around top of the excavation to prevent debris from being dislodged into the excavation and concrete.

-- End of Section --

SECTION 03330

CAST-IN-PLACE ARCHITECTURAL CONCRETE
03/89
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 211.2	(1991) Standard Practice for Selecting Proportions for Structural Lightweight Concrete
ACI 301	(1996) Standard Specification for Structural Concrete
ACI 315	(1994) ACI Detailing Manual: Section Details and Detailing of Concrete Reinforcement
ACI 318/318R	(1995) Building Code Requirements for Structural Concrete and Commentary
ACI 318M	(1995) Building Code Requirements for Structural Concrete and Commentary (Metric)
ACI 347R	(1994) Guide to Formwork for Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M	(1996) Carbon Structural Steel

1.2 GENERAL REQUIREMENTS

All materials, procedures, and requirements specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE shall fully apply to cast-in-place architectural concrete, except as otherwise specified.

1.2.1 Design Requirements

1.2.1.1 Concrete Mix

The concrete mix shall be designed in accordance with ACI 211.1 and ACI 211.2. The mix design shall include consideration of the finishes required.

1.2.1.2 Formwork Design

Formwork design shall conform to ACI 301 and ACI 347R.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Architectural Concrete; GA.

Detail drawings showing details conforming to ACI 315 and ACI 318/318R. Detail drawings shall show location of cast-in-place elements in the work, building elevations, formwork fabrication details, reinforcements, embedments, dimensions, concrete strength, interface with adjacent materials, and special placing instructions, in sufficient detail to cover fabrication, placement, stripping, and finishing.

SD-14 Samples

Materials; GA. Panels; GA.

Materials listed below, which shall indicate sizes, shapes, finishes, color, and pertinent accessories: Form Ties, Form Liners, Cement Colors, Coarse Aggregate, Reinforcing Chairs.

Sample panels, located as directed, shall be 6 feet long and 4 feet high with the thickness to match building conditions for each type of architectural concrete and finish. Panel forms shall include a typical joint between form panels, form tie conditions and finishes. Panels shall be protected from weather, and other damage until acceptance of work. Sample panels shall be used as job standards throughout construction.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Aggregates

Aggregates shall conform to SECTION 03300.

2.1.2 Reinforcing Steel

Reinforcing steel shall be galvanized if clearance to an exterior face is 1 inch or less.

2.1.3 Tie Wire

Tie wire shall be soft monel or 18-8 stainless steel.

2.1.4 Plates, Angles, Anchors, and Embedments

Plates, angles, anchors, and embedments shall conform to ASTM A 36/A 36M, and shall be prime painted with inorganic zinc primer.

2.1.5 Formwork

Formwork for special effects shall be as approved.

2.1.6 Form Release Agents

Form release agents shall be manufacturer's standard, nonstaining,

nonpetroleum based, compatible with surface sealer finish coating.

2.1.7 Surface Sealer

Surface sealer shall be methyl methacrylate polymer acrylic emulsion, clear color.

PART 3 EXECUTION

3.1 FORMWORK ERECTION

Formwork shall be erected in accordance with the detail drawings to ensure that the finished concrete members conform accurately to the indicated dimensions, lines, elevations, and finishes. Deflection shall not exceed 1/360th of each component span or distance between adjacent supports. Deflections and tolerance shall not be cumulative. Form lines shall be installed as necessary to provide the required finish. Forms shall be coated with form release agents before reinforcement is placed. Formwork shall conform to ACI 301 and ACI 347R.

3.2 CONCRETE FINISHES

Concrete finishes shall conform to the approved finishes. Finishing shall be accomplished at the time of concrete placement or immediately after formwork removal. Cast-in-place concrete elements which are to have a finish other than the surface produced from standard formwork, shall be accomplished by using the following procedures: All Architectural concrete shall have a smooth finish as cast using flat smooth non-porous forms.

3.3 JOINT SEALING

Joint sealing shall be as specified in Section 07900 JOINT SEALING.

3.4 CLEANING

No sooner than 72 hours after joints are sealed, faces and other exposed surfaces of cast-in-place concrete shall be washed down, cleaned with soap and water applied with a soft bristle brush, then washed down again with clean water, or by other approved procedures. Discolorations which cannot be removed by these procedures, shall be considered defective work. Cleaning work shall be done when temperature and humidity conditions are such that surfaces dry rapidly. Care shall be taken during cleaning operations to protect adjacent surfaces from damage.

3.5 SURFACE SEALING

After cleaning, exterior exposed architectural concrete surfaces indicated shall be given one coat of surface sealer, spray applied unless otherwise approved. Adjacent surfaces shall be protected to prevent damage from the surface sealer.

3.6 PROTECTION OF WORK

Work shall be protected against damage from subsequent operations.

3.7 DEFECTIVE WORK

Defective work shall be repaired or replaced, as directed, using approved procedures.

-- End of Section --

SECTION 03370

CONCRETE FLOOR HARDENER
AMENDMENT #0001

PART 1 GENERAL

1.1 SUMMARY

Apply concrete floor hardener to interior concrete floors which do not receive a floor covering.

1.2 REFERENCES (NOT APPLICABLE)

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Manufacturer's Catalog Data; FIO.

Safety Considerations; FIO.

Safety considerations include the manufacturer's safety precautions and procedures required for the safe application of concrete floor hardener.

SD-06 Instructions

Manufacturer's Instructions; FIO.

Manufacturer's recommended handling and application instructions shall be submitted.

SD-13 Certificates

Certificates of Compliance; FIO.

Certificates of compliance stating that the concrete floor hardener materials conform to the requirements specified shall be submitted.

1.4 DELIVERY, HANDLING AND STORAGE

In addition to the following requirements, concrete hardener shall be delivered, stored, and handled in accordance with the manufacturer's requirements. Material delivered and placed in storage shall be stored off the ground and protected from moisture, dirt, and other contaminants. Hardener shall be delivered in the manufacturer's original unopened containers. Hardener whose shelf life has expired shall be removed from

the site. Handling and safety precautions shall be in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.1 FLOOR HARDENER

Floor hardener shall be a colorless aqueous solution containing not less than 2 pounds of zinc and/or magnesium fluosilicate per gallon, or sodium silicate solution having a specific gravity of 16.7 degrees Baume, or shall be an approved proprietary hardener of proven satisfactory performance delivered ready to use in the manufacturer's original containers.

PART 3 EXECUTION

3.1 EXAMINATION

Inspect the concrete to be treated to ensure it is sound, clean, and free of visible dirt, oil, grease, wax, or other foreign material, and, that the finishing work is complete.

3.2 PREPARATION

Prior to treatment, the floors shall be thoroughly cured, cleaned, and perfectly dry with all work above them completed. New concrete floors shall be air dried for 28 days prior to hardener application. Membrane-forming curing compounds shall not be used on surfaces that will be treated with floor hardener.

3.3 APPLICATION

Apply with a sprayer, roller, brush, or by flooding followed by squeegee in accordance with the manufacturer's recommendations. Zinc and/or magnesium fluosilicate shall be applied evenly in three coats, with 24 hours between coats. The first coat shall be 1/3 of full strength, the second 1/2 of full strength, and the third coat 2/3 of full strength. Each coat shall be allowed to remain wet on the concrete surface for 15 minutes. Sodium silicate shall be applied evenly in three coats, with 24 hours between coats. The sodium silicate shall be applied full-strength at the rate of 1 and 1/3 liters per 10 square meters. Approved proprietary hardeners shall be applied in conformance with the manufacturer's instructions. Eliminate puddles as soon as possible. After the final coat is dry, surplus hardener shall be removed from the surface by scrubbing and mopping with water. Immediately wash off any hardener compound accidentally sprayed on glass or aluminum using clean, clear water.

3.4 FIELD QUALITY CONTROL

The Contractor shall:

a. Visually inspect treated concrete surfaces to ensure an adequate membrane seal has been produced.

b. Inspect treated surfaces for signs of overapplication, and remove excess material.

c. Inspect adjacent glass or aluminum areas and remove any accidental spraying.

3.5 PROTECTION

Restrict traffic over treated surfaces for 48 hours or longer after

application.

-- End of Section --

SECTION 04735

CAST STONE
03/2000
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 318M/318RM	(1989; Rev 1992) Building Code Requirements for Reinforced Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 615	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 642	(1990) Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Drawing Quality, Special Killed
ASTM C 33	(1993) Concrete Aggregates.
ASTM C 150	(1996) Portland Cement.
ASTM C 494	(1992) Concrete Admixtures.
ASTM C 979	(1982; R 1993) Coloring Pigments for Integrally Pigmented Concrete.
ASTM C 1194	Test Method for Compressive Strength of Architectural Cast Stone.
ASTM C 1195	Test Method for Absorption of Architectural Cast Stone.

CAST STONE INSTITUTE (CS)

CS-01	(Current Edition) Cast Stone Institute Technical Manual.

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Cast Stone; FIO.

Shop Drawings: Submit for approval the following:

a. Copies of shop drawings showing details of the stone to be provided including: profiles, cross-sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, annotation of stone types and their location.

b. Unless otherwise shown on contract drawings:

(1)- Provide suitable wash on all exterior sills, coping, projecting courses and pieces with exposed top surfaces.

(2) Provide drips.

SD-13 Samples

Cast Stone; GA.

Submit for approval the following:

a. Samples of the Cast Stone specified which will be representative of the general range of color and finish to be furnished.

b. Test results of Cast Stone previously made by the manufacturer.

1.3 QUALITY ASSURANCE

1.3.1 Qualification of manufacturer

a. Shall be a current producer member of the Cast Stone Institute.

b. The Manufacturer shall have a minimum of five years of continuous operation, having experience, adequate facilities and capacity to furnish the quality, sizes and quantity of cast stone required without delaying the progress of the work, and whose products have been previously used and exposed to the weather with satisfactory results.

1.3.2 Cast Stone

All cast stone used in this work shall be manufactured by the same manufacturer.

1.3.3 Testing

Test compressive strength and absorption of three specimens at random from plant production in accordance with referenced standards.

1.4 MOCK-UP

Prior to construction of cast stone sill, provide for approval full size unit for use in construction of sample wall and construct a 4-foot by 5-foot sample wall, including interior and exterior corners. Construction of cast stone sills will not proceed until approval of the sample wall. The mock-up becomes the standard of workmanship for the project.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Architectural Cast Stone

Physical properties: Provide the following:

a. Compressive Strength, ASTM C 1194:min. for products at 28 days. or;

b. Absorption, ASTM C 1195 or ASTM C642: 6% max. for products at 28 days.

c. Divide results of field cut specimens by .8 to determine minimum compressive strength requirements.

2.1.2 Raw materials

2.1.2.1 Portland cement

Type I or m, white and/or gray, ASTM C 150.

2.1.2.2 Coarse aggregates

Granite, quartz or limestone, ASTM C 33, except for gradation.

2.1.2.3 Fine aggregates

Manufactured or natural sands, ASTM C 33, except for gradation.

2.1.2.4 Colors

Inorganic iron oxide pigments, ASTM C 979.

2.1.2.5 Admixtures

ASTM C 494.

2.1.2.6 Water

Potable.

2.2 COLOR AND FINISH

2.2.1 Color

Color shall be as indicated in Section 09000 BUILDING COLOR & FINISH SCHEDULE.

2.2.2 Exposed Surfaces

Exposed surfaces, unless otherwise specified, shall exhibit a fine "rained texture similar to that of natural stone. No bugholes or air voids will be permitted.

2.2.3 Variation

Must match color and finish of approved sample subjected to similar aging and weathering conditions when viewed in direct daylight at a 10 foot distance.

ASTM color variation allowed - 2%, hue, 6% lightness, chrome and hue combined.

2.3 CURING AND FINISHING

a. Cast stone shall be cured with a direct fired steam generator at a

minimum temperature of 105 degrees F for a minimum of 6 hours within 12 hours of product fabrication. Curing shall be performed in the presence of CO and CO2 to promote carbonation at the surface of the product for efflorescence control.

b. Remove cement film from exposed surfaces prior to packaging for shipment.

2.4 REINFORCING

New billet steel reinforcing bars - ASTM A 615:

a. Reinforce units when necessary for handling and structural stresses.

b. Reinforcement shall be galvanized or epoxy coated when covered with less than 1-1/2 inches of material.

c. Area of reinforcement in panels shall be not less than 1/4 of one percent of the cross section area and otherwise as required by ACI 318 Building Code Requirements for Reinforced Concrete.

2.5 RELATED MATERIALS

2.5.1 Anchors

Non-corrosive; stainless steel type 304.

2.5.2 Mortar

Type N, ASTM C 270.

PART 3 EXECUTION

3.1 [Enter Appropriate Subpart Title Here]3.1.1 TOLERANCES

a. Comply with CS-01 Cast Stone Institute Technical Manual.

b. Set stones 1/8-inch or less, within plane of adjacent unit.

c. Joints, +1/16 inch, -1/8 inch.

3.2 JOINTING

3.2.1 Joint size

b. At stone/stone joints in vertical position 1/4-inch (3/8-inch optional).

c. Stone/stone joints exposed on top side 3/8-inch.

3.2.2 Joint material

a. Use a full bed of mortar at all bed joints.

b. Flush vertical joints full with mortar.

c. Leave all joints with exposed tops or under relieving angles open for sealant.

3.2.3 Location of Joints

a. As shown on approved shop drawings.

b. Unless otherwise shown: at control and expansion joints in accordance with the drawings.

3.3 SETTING

a. Drench stones with clear, running water just prior to setting.

b. Fill all dowel holes and anchor slots completely with mortar or non-shrink grout.

c. Set all stones in a full bed of mortar unless otherwise detailed. Leave head joints in coping and similar stones open for sealant.

d. Rake mortar joints for pointing. Sponge the face of each stone to remove excess mortar.

e. Tuck point stone joints to a slight concave profile.

f. Sealant joints - Prime the ends of stones, insert properly sized foam backup rod and gun-in sealant.

g. Protect stone while on ground (and after setting) from splashing, mortar and damage from other trades.

3.4 CLEANING AND REPAIR

a. Clean stone by wetting with clear running water and applying a cleaning solution such as "Sure Clean #600" by ProSoCo Products, Inc. or as recommended by the manufacturer. Follow manufacturer's instructions.

b. Repair obvious chips with touchup material furnished by the manufacturer.

-- End of Section --

SECTION 07240

EXTERIOR INSULATION AND FINISH SYSTEMS
10/01
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM C 67	(2000)Sampling and Testing Brick and Structural Clay products
ASTM C 150	(2000) Portland Cement
ASTM C 473	(2000) Physical Testing of Gypsum Panel Products
ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 847	(1995) Metal Lath
ASTM C 920	(1998) Elastomeric Joint Sealants
ASTM C 1177/C 1177M	(1999) Glass Mat Gypsum Substrate for Use as Sheathing
ASTM D 968	(1993) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 2247	(1999) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D 3273	(2000) Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
ASTM E 84	(2000) Surface Burning Characteristics of Building Materials
ASTM E 330	(1997) Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 331	(2000) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 695	(1997) Measuring Relative Resistance of Wall, Floor, and Roof Construction to

	Impact Loading
ASTM G 23	(1996) Operating Light-Exposure Apparatus (Carbon-Arc Type) with and Without Water for Exposure of Nonmetallic Materials

EXTERIOR INSULATION MANUFACTURERS ASSOCIATION (EIMA)

EIMA TM 105.01	(1995) Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finish Systems

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

UBC 26-4	Evaluation of Flammability Characteristics of Exterior, Non load-Bearing Wall Panel Assemblies using Foam Plastic Insulation
UBC 26-9	Evaluation of Flammability Characteristics of Exterior Non load-Bearing Wall Assemblies Containing Combustible Components using Intermediate-Scale, Multistory Test Apparatus Title

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 268	(1996) Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source

1.2 SYSTEM DESCRIPTION AND REQUIREMENTS

The exterior insulation and finish system (EIFS) shall be a job-fabricated exterior wall covering consisting of sheathing, insulation board, reinforcing fabric, base coat, finish coat, adhesive and mechanical fasteners as applicable. The system components shall be compatible with each other and with the substrate as recommended or approved by, and the products of, a single manufacturer regularly engaged in furnishing Exterior Insulation and Finish Systems. All materials shall be installed by an applicator approved by the system manufacturer. EIFS shall be Class PB and shall be color as indicated on the drawings and semi-smooth finish. E.I.F.S. shall be a drainable system with a drainable track.

1.2.1 System Requirements and Tests

The system shall meet the performance requirements as verified by the tests listed below. Where a wall system of similar type, size, and design as specified for this project has been previously tested under the condition specified herein, the resulting test reports may be submitted in lieu of job specific tests.

1.2.1.1 Water Penetration

Test the system for water penetration by uniform static air pressure in accordance with ASTM E 331. There shall be no penetration of water beyond the plane of the base coat/EPS board interface after 15 minutes at 6.4 psf), or 20% of positive design wind pressure, whichever is greater.

1.2.1.2 Wind Load

Test the system for wind load by uniform static air pressure in accordance with ASTM E 330 (procedure A) to a minimum pressure of 6.4 psf. There

shall be no permanent deformation, delamination, or other deterioration.

1.2.1.3 Full scale or intermediate scale fire test

Conduct wall fire test using apparatus, specimen, performance criteria, and procedure in accordance with UBC 26-4. The specimen shall include the complete system using 2 inch thick insulation board. At the option of the contractor, UBC 26-9, Intermediate-Scale Test may be substituted in lieu of the Full-Scale Multi- Story Fire test. The following requirements shall be met:

a. No vertical spread of flame within core of panel from one story to the next.

b. No flame spread over the exterior surface.

c. No vertical flame spread over the interior surface from one story to the next.

d. No significant lateral spread of flame from compartment of fire origin to adjacent spaces.

1.2.1.4 Mock-Up Installation of EIFS

Complete wall mock-up installation 8 ft high by 8 ft wide, including typical control joints and at least one window opening. Control joints to be filled with sealant of type, manufacturer, and color selected. Construct mock-up installation at job site. Build mock-up to comply with the following requirements, using materials indicated for the completed work:

a. Locate mock-up installation(s)in the location and size as directed by the Contracting officer.

b. Demonstrate the proposed range of color, texture, thickness, insulation, and workmanship.

c. Obtain Contracting Officer's written approval of mock-up before starting fabrication of work.

d. Maintain mock-up installation(s) during construction as a standard for judging the completed work by protecting them from weather and construction activities.

e. When directed, demolish and remove mock-up from the site.

1.2.2 Component Requirements and Tests

The components of the system shall meet the performance requirements as veryfied by the tests listed below.

1.2.2.1 Surface Burning Characteristics

Conduct ASTM E 84 test on samples consisting of insulation board, base coat, reinforcing fabric, and finish coat. Cure for 28 days. The flame spread index shall be 25 or less and the smoke developed index shall be 450 or less.

1.2.2.2 Radiant Heat

The system shall be tested in accordance with NFPA 268 with no ignition during the 20-minute period.

1.2.2.3 Impact Resistance

a. Impact Mass: Test 28 day cured specimen of PB EIFS in accordance with ASTM E 695. The test specimen shall exhibit no cracking or denting after twelve impacts by 85 lbs lead shot mass from 6 in to 6 ft drop heights in 6 in intervals.

1.2.3 Sub-Component Requirements and Tests

Unless otherwise stated, the test specimen shall consist of reinforcement, base coat, and finish coat applied in accordance with manufacturer's printed recommendations to the insulation board to be used on the building. For mildew resistance, only the finish coat is applied onto glass slides for testing. These specimen shall be suitably sized for the apparatus used and be allowed to cure for a minimum of 28 days prior to testing.

1.2.3.1 Abrasion Resistance

Test in accordance with ASTM D 968, Method A. Test a minimum of two specimen. After testing, the specimens shall show only very slight smoothing, with no loss of film integrity after 132 gallons of water.

1.2.3.2 Accelerated Weathering

Test in accordance with ASTM G 23, Method 1. After 2000 hours specimens shall exhibit no visible cracking, flaking, peeling, blistering, yellowing, fading, or other such deterioration.

1.2.3.3 Mildew Resistance

Test in accordance with ASTM D 3273. The specimen shall consist of the finish coat material, applied to clean 3 inch by 4 inch glass slides and shall be allowed to cure for 28 days. After 28 days of exposure, the specimen shall not show any growth.

1.2.3.4 Salt Spray Resistance

Test in accordance with ASTM B 117. The specimen shall be a minimum of 4 inch by 6 inch and shall be tested for 300 hours. After exposure, the specimen shall exhibit no observable deterioration, such as chalking, fading , or rust staining.

1.2.3.5 Water Resistance

Test in accordance with ASTM D 2247. The specimen shall be a minimum of 4 inch by 6 inch. After 14 days, the specimen shall exhibit no cracking, checking, crazing, erosion, blistering, peeling, or delamination.

1.2.3.6 Absorption-Freeze/Thaw

Class PM systems shall be tested in accordance with ASTM C 67 for 50 cycles of freezing and thawing. After testing, the specimens shall exhibit no cracking or checking,and have negligible weight gain.

1.2.3.7 Sample Boards

Unless otherwise stated, provide sample EIFS Component12 by 24 inches, on sheathing board, including finish color and texture, typical joints and sealant. If more than one color, finish, or pattern is used, provide one sample for each. The test specimen shall consist of reinforcement, base coat, and finish coat applied in accordance with manufacturer's printed recommendations to the insulation board to be used on the building.

1.2.4 Moisture Analysis

Perform a job specific vapor transmission analysis based on project specific climate and specified wall components and materials. Indicate the temperatures and relative humidities for the inside and outside of the building; a complete listing of the building components, their thickness, thermal resistance and permeance, as well as building location and use. If a mathematical model was used for the analysis, include the name of the model and the supplier/developer.

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Shop drawings; G

Show wall layout, construction and expansion joints, decorative grooves, layout of sheathing board, thermal insulation board, and reinforcement mesh and strip reinforcing fabric; joint and flashing details including details of striated drain membrane and base flashings as recommended by manufacturer; details at wall penetrations; types and location of fasteners; details at windows and doors; and details at base, roof, parapet, and corners.

SD-03 Product Data

Sheathing board

Thermal insulation

Adhesive

Mechanical Fasteners

Accessories

Base coat

Portland cement

Reinforcing fabric

Finish coat

Joint Sealant

Primer

Bond breaker

Backer Rod

Insulation Board

Warranty

Include joint and other details, such as end conditions, corners, windows, parapet. Include shelf life and recommended cleaning

solvents in data for sealants. Include material safety data sheets (MSDS)for all components of the EIFS. The MSDS shall be available at the job site.

SD-04 Samples

Sample Boards; G

Color and Texture

Mock-up Installation of EIFS; G

SD-05 Design Data

Wind load Calculations

Moisture analysis Calculations

SD-06 Test Reports

Abrasion resistance

Accelerated weathering

Impact resistance

Mildew resistance

Salt spray resistance

Water vapor transmission

Absorption-freeze-thaw

Flame spread

Water penetration

Water resistance

Full scale or intermediate scale fire test

Flame spread

Surface Burning Characteristics

Radiant heat

substrate

Wind load

SD-07 Certificates

Qualifications of EIFS Manufacturer

Qualification of EIFS Installer

Qualification of Sealant Applicator

Certify that EIFS installer meets requirements specified under paragraph "Qualification of Installer," and that sealant

applicator is approved by the EIFS Manufacturer.

Qualifications of Third Party Inspector

Submit evidence that third party inspector has current certification from the Exterior Design Institute or equal inspector certification as inspector for the installation of EIFS.

Inspection Check List; G

Submit filled-out inspection check list as required in paragraph "Quality Control," certifying that the installation of critical items meets the requirements of this specification.

SD-08 Manufacturer's Instructions

Installation

Manufacturer's standard printed instructions for the installation of the EIFS. Include requirements for condition and preparation of substrate, installation of EIFS, and requirements for sealants and sealing.

SD-10 Operation and Maintenance Data

EIFS

Include detailed finish repair procedures and information regarding compatibility of sealants with base and finish coatings.

1.4 QUALITY ASSURANCE

1.4.1 Qualifications of EIFS Manufacturer

The EIFS shall be the product of a manufacturer who has been in the practice of manufacturing and designing EIFS for a period of not less than 3 years, and has been involved in at least five projects similar to this project in size, scope, and complexity, in the same or a similar climate as this project.

1.4.2 Qualification of EIFS Installer

The EIFS Installer shall be trained and approved by the EIFS manufacturer to install the system and shall have successfully installed at least five projects at or near the size and complexity of this project. The contractor shall employ qualified workers trained and experienced in installing the manufacturer's EIFS.

1.4.3 Qualification of Sealant Applicator

The sealant applicator shall be experienced and competent in the installation of high performance industrial and commercial sealants and shall have successfully installed at least five projects at or near the size and complexity of this project.

1.4.4 Insulation Board

Insulation Board shall be approved and labeled under third party quality program as required by applicable building code.

1.4.5 Pre-Installation Conference

After approval of submittals and before commencing any work on the EIFS , including installation of any sheathing board, insulation, and associated work, the Contracting Officer will hold a pre-installation conference to review:

a. Drawings, specifications, and samples;

b. Procedure for on site inspection and acceptance of EIFS substrate and pertinent details (for example, mock-up installation);

c. Contractor's plan for coordination of work of the various trades involved in providing EIF system and other components;

d. Inspection procedures; and

e. Safety requirements.

Pre-installation conference shall be attended by the Contractor, EIFS Q.C. Specialist (EIFS Inspector), and all personnel directly responsible for installation of the EIF system, including sealant applicator, and personnel responsible for related work, such as flashing and sheet metal, windows and doors, and a representative of the EIFS manufacturer. Before beginning EIFS work, the contractor shall confirm in writing the resolution of conflicts among those attending the preinstallation conference.

1.5 DELIVERY AND STORAGE

Deliver materials to job site in original unopened packages, marked with manufacturer's name, brand name, and description of contents. Store materials off the ground and in accordance with the manufacturer's recommendations in a clean, dry, well-ventilated area. Protect stored materials from rain, sunlight, and excessive heat. Keep coating materials which would be damaged by freezing at a temperature not less than 40 degrees F. Do not expose insulation board to flame or other ignition sources.

1.6 ENVIRONMENTAL CONDITIONS

a. Do not prepare materials or apply EIFS during inclement weather unless appropriate protection is provided. Protect installed materials from inclement weather until they are dry.

b. Apply sealants and wet materials only at ambient temperatures of 40 degrees F or above and rising, unless supplemental heat is provided. The system shall be protected from inclement weather and to maintain this temperature for a minimum of 24 hours after installation.

c. Do not leave insulation board exposed to sunlight after installation.

1.7 WARRANTY

Furnish manufacturer's standard warranty for the EIFS. Warranty shall run directly to Government and cover a period of not less than 5 years from date Government accepts the work.

PART 2 PRODUCTS

2.1 COMPATIBILITY

Provide all materials compatible with each other and with the substrate,

and as recommended by EIFS manufacturer.

2.2 SHEATHING BOARD

2.2.1 Glass Mat Gypsum Sheathing Board

a. Conform to ASTM C 1177/C 1177M.

b. Nail Pull Resistance: No less than 120 lb when tested in accordance with ASTM C 473.

c. Thickness of board shall be [AM#1]1/2" min.

2.3 ADHESIVE

Manufacturer's standard product, including primer as required, and shall be compatible with substrate and insulation board to which the system is applied.

2.4 LATHING AND FURRING

Conform to ASTM C 847, 2.6 lb/yd, self-furring, galvanized.

2.5 THERMAL INSULATION

2.5.1 Manufacturer's Recommendations

Provide only thermal insulation with moisture drainage channels running every 6" horizontally and vertically as recommended by the EIFS manufacturer for the type of application intended.

2.6 BASE COAT

Manufacturer's standard product and compatible with other systems components.

2.7 PORTLAND CEMENT

Conform to ASTM C 150, Type I or II as required, fresh and free of lumps, and approved by the systems manufacturer.

2.8 REINFORCING FABRIC

Reinforcing fabric mesh shall be alkali-resistant, balanced, open weave , glass fiber fabric made from twisted multi-end strands specifically treated for compatibility with the other system materials, and comply with EIMA TM 105.01 and as recommended by EIFS manufacturer.

2.9 FINISH COAT

Manufacturer's standard product conforming to the requirements in the paragraph on Sub-Component Requirements and Tests. For color consistency, use materials from the same batch or lot number.

2.10 PRIMER

Non-staining, quick-drying type recommended by sealant manufacturer and EIFS manufacturer.

2.11 ACCESSORIES

Conform to recommendations of EIFS manufacturer, including trim, edging,

anchors, expansion joints, striated drain membrane, base flashing. All metal items and fasteners to be corrosion resistant.

2.12 JOINT SEALANT

Non-staining, quick-drying type meeting ASTM C 920, Class 25, compatible with the finish system type and grade, and recommended by both the sealant manufacturer and EIFS manufacturer.

2.13 BOND BREAKER

As required by EIFS manufacturer and recommended by sealant manufacturer and EIFS manufacturer.

2.14 BACKER ROD

Closed cell polyethylene free from oil or other staining elements and as recommended by sealant manufacturer and EIFS manufacturer. Do not use absorptive materials as backer rod. The backer rod should be sized 25 percent larger than the width of the joint.

2.15 15 LB BUILDING FELT

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrate and existing conditions to determine that the EIFS can be installed as required by the EIFS manufacturer and that all work related to the EIFS is properly coordinated. Surface shall be sound and free of oil, loose materials or protrusions which will interfere with the system installation. If deficiencies are found, notify the Contracting Officer and do not proceed with installation until the deficiencies are corrected. The substrate shall be plane, with no deviation greater than 1/4 inch when tested with a 10 foot straightedge. Determine flatness, plumbness, and any other conditions for conformance to manufacturer's instructions.

3.2 SURFACE PREPARATION

Prepare existing surfaces for application of the EIFS to meet flatness tolerances and surface preparation according to manufacturer's installation instructions but provide a flatness of not more that 1/4 inch in 10 feet. Provide clean surfaces free of oil and loose material without protrusions adversely affecting the installation of the insulation board. For adhesively attached EIFS, existing deteriorated paint must be removed. Due to substrate conditions or as recommended by the system manufacturer, a primer may be required. Apply the primer to existing surfaces as recommended by the manufacturer. Use masking tape to protect areas adjacent to the EIFS to prevent base or finish coat to be applied to areas not intended to be covered with the EIFS. The contractor shall not proceed with the installation until all noted deficiencies of the substrate are corrected.

3.3 INSTALLATION

Install EIFS as indicated, and comply with manufacturer's instructions except as otherwise specified, and in accordance with the shop drawings. EIFS shall be installed only by an applicator trained and approved by the EIFS manufacturer. Specifically, include all manufacturer recommended provisions regarding flashing and treatment of wall penetrations.

3.3.1 Sheathing Board

Edges and ends of boards shall be butted snugly with vertical joints staggered to provide full and even support for the insulation. Do not align sheathing board joints with wall openings. Provide support at both vertical and horizontal joints. Attach sheathing board to metal studs and/or existing corrugated metal panel substrate with self-tapping drywall screws and to concrete or masonry with corrosion resistant metal fasteners. Place fasteners sufficiently close to support imposed loads, but not more than:

a. 8 inches apart on each supporting stud

b. 12 inches apart horizontally and vertically into concrete .

Space fasteners more closely when required for negative wind load resistance.

3.3.2 Insulation Board

Unless otherwise specified by the system manufacturer, place the long edge horizontally from level base line. Stagger vertical joints and interlock at corners. Butt joints tightly. Provide flush surfaces at joints. Offset insulation board joints from joints in sheathing by at least 8 inches. Use L-shaped insulation board pieces at corners of openings. Joints of insulation shall be butted tightly. Surfaces of adjacent insulation boards shall be flush at joints. Gaps greater than 1/16 inch between the insulation boards shall be filled with slivers of insulation. Uneven board surfaces with irregularities projecting more than 1/16 inch shall be rasped in accordance with the manufacturer's instructions to produce an even surface. Attach insulation board as recommended by manufacturer. The adhered insulation board shall be allowed to remain undisturbed for 24 hours prior to proceeding with the installation of the base coat/reinforcing mesh, or longer if necessary for the adhesive to dry. However, do not leave insulation board exposed longer than recommended by insulation manufacturer.

3.3.2.1 Adhesively Fastened Insulation Boards

Apply insulation board using adhesive spread with a notched trowel to the back of the insulation boards in accordance with the manufacturer’s instructions.

3.3.3 Base Coat and Reinforcing Fabric Mesh

3.3.3.1 Class PB Systems

Mix base coat in accordance with the manufacturer's instructions and apply to insulated wall surfaces to the thickness specified by the system manufacturer and provide any other reinforcement recommended by EIFS manufacturer. Trowel the reinforcing fabric mesh into the wet base coat material. Fully embed the mesh in the base coat. When properly worked-in, the pattern of the reinforcing fabric mesh shall not be visible. Provide diagonal reinforcement at opening corners. Back-wrap all terminations of the EIFS. Overlap the reinforcing fabric mesh a minimum of 2 inches on previously installed mesh, or butted, in accordance with the manufacturer’s instructions. Allow the adhered insulation board to dry for 24 hours, or longer if necessary, prior to proceeding with the installation of the base coat/reinforcing fabric mesh. Install reinforcing fabric in accordance with and manufacturer's instructions.

3.3.4 Finish Coat

Apply and level finish coat in one operation. Obtain final texture by trowels, floats, or by spray application as necessary to achieve the required finish matching approved sample and mock-up installation. Apply the finish coat to the dry base coat maintaining a wet edge at all times to obtain a uniform appearance. The thickness of the finish coat shall be in accordance with the system manufacturer’s current published instructions. Apply finish coat so that it does not cover surfaces to which joint sealants are to be applied. The base coat/reinforcing mesh must be allowed to dry a minimum of 24 hours prior to the application of the finish coat. Surface irregularities in the base coat, such as trowel marks, board lines, reinforcing mesh laps, etc., shall be corrected prior to application of the finish coat.

3.4 JOINT SEALING

Seal EIFS at openings as recommended by the system manufacturer. Apply sealant only to the base coat. Do not apply sealant to the finish coat.

3.4.1 Surface Preparation, Backer Rod, and Primer

Immediately prior to application, remove loose matter from joint. Ensure that joint is dry and free of paint, finish coat, or other foreign matter. Install backer rod. Apply primer as required by sealant and EIFS manufacturer. Check that joint width is as shown on drawings but in no case shall it be less than 0.5 inch for perimeter seals and 0.75 inch for expansion joints. The width shall not be less than 4 times the anticipated movement. Check sealant manufacturer's recommendations regarding proper width to depth ratio.

3.4.2 Sealant

Apply sealant in accordance with sealant manufacturer's instructions with gun having nozzle that fits joint width. Do not use sealant that has exceeded shelf life or can not be discharged in a continuous flow. Completely fill the joint solidly with sealant without air pockets so that full contact is made with both sides of the joint. Tool sealant with a round instrument that provides a concave profile and a uniformly smooth and wrinkle free sealant surface. Do not wet tool the joint with soap, water, or any other liquid tooling aid. Do not apply sealant until all EIFS coatings are fully dry. During inclement weather, protect the joints until sealant application. Use particular caution in sealing joints between window and door frames and the EIFS wall and at all other wall penetrations. Clean all surfaces to remove excess sealant.

3.5 FIELD QUALITY CONTROL

Throughout the installation, the contractor shall establish and maintain an inspection procedure to assure compliance of the installed EIFS with contract requirements. Work not in compliance shall be removed and replaced or corrected in an approved manner. The inspection procedures, from acceptance of deliveries through installation of sealants and final acceptance shall be performed by qualified inspector trained by the manufactuter. No work on the EIFS shall be performed unless the inspector is present at the job site.

3.5.1 Third Party Inspection

Provide full time third party inspection during the entire process of installing the EIFS, from examination through cleanup. The third party inspector shall be certified by the Exterior Design Institute (EDI) or by an equivalent independent party and shall be trained in the proper installation of EIFS.

3.5.2 Inspection Check List

During the installation and at the completion of installation, perform inspections covering at the minimum all applicable items enumerated on the attached check list. The inspector shall initial and date all applicable items, sign the check list, and submit it to the Contracting Officer at the completion of the EIFS erection.

CHECK LIST

Item	Description	Appr'd/Date
a.	Materials are handled and stored correctly.	
b.	Environmental conditions are within specified limits, including temperature not below 4 degrees C 40 degrees F, and the work is protected from the elements as required.	
c.	Preparation and installation is performed by qualified personnel using the correct tools.	
d.	Adjacent areas to which EIFS is not to be applied (such as on window and door frames) are protected with masking tape, plastic films, drop cloths, etc. to prevent accidental application of EIFS materials.	
e.	Control, expansion and aesthetic joints are installed as indicated or recommended. Accessories are properly installed.	
f.	Substrate is in-plane, properly attached, clean, dry, and free of contaminants. Concrete substrate is free of efflorescence.	
g.	Materials are mixed thoroughly and in proper proportions.	
h.	Adhesive is applied in sufficient quantity with proper-size notched trowel.	
i.	Mechanical attachments have proper spacing, layout and fastener depth.	
j.	Insulation boards are tightly abutted, in running bond pattern, with joints staggered with the sheathing, board corners interlocked, L-shaped boards around openings, edges free of adhesive, and provision for joints. Gaps are filled and surfaces rasped.	
k.	Insulation adhesive must be allowed to dry (a minimum of 24-hours) prior to the application of the finish coat.	
l.	Reinforcing fabric mesh is properly back-wrapped at terminations.	
m.	Reinforcing fabric mesh is fully embedded and properly placed. Corners are reinforced. Openings are diagonally reinforced. Mesh overlaps minimum 65 mm 2-1/2 inches.	
n.	Base coat thickness is within specified limits.	

CHECK LIST

Item	Description	Appr'd/Date
o.	The base coat/reinforcing fabric mesh must be allowed to dry (a minimum of 24-hours) prior to the application of the finish coat.	_____ ____
p.	Finish coat is applied with sufficient number of personnel and stopped at suitable points. Floats and methods of texturing are uniform.	_____ ____
q.	All Flashings are properly installed.	_____ ____
r.	All joints are properly sealed in their entire length at time and under environmental conditions as specified by the manufacturer.	_____ ____
s.	All scaffolding, equipment, materials, debris and temporary protection are removed from site upon completion.	_____ ____

Name of Inspector:_____ Signed:_____ Date:_____

3.6 CLEANUP

Upon completion, remove all scaffolding, equipment, materials and debris from site. Remove all temporary protection installed to facilitate installation of EIFS.

-- End of Section --

SECTION 08120

ALUMINUM DOORS AND FRAMES
03/94
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1980; R 1993) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 605.2	(1992; Addenda Jan 1995) Voluntary Specification for High Performance Organic Coatings on Architectural Aluminum Extrusions and Panels
AAMA 1503.1	(1988) Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 209	(1996) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 221	(1996) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 330	(1990) Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 331	(1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 SYSTEM DESCRIPTION

Swing-type aluminum doors and frames, of size and design shown on the drawings, shall be provided at the locations indicated. Doors shall be furnished complete with frames, subframes, transoms, adjoining sidelights, trim, and other accessories indicated and specified Adjoining sidelights shall have horizontal safety rails..

1.3 PERFORMANCE REQUIREMENTS

1.3.1 Wind Load Performance

Doors and frames shall be of sufficient strength to withstand a design wind load of 30 pounds per square foot of supported area with a deflection of not more than 1/175 times the length of the member. Doors shall be tested in accordance with ASTM E 330 at a pressure not less than 1.5 times the design load.

1.3.2 Water Penetration Performance

Frames and fixed areas, and non-handicap complying doors shall have no water penetration when tested in accordance with ASTM E 331 at a pressure of 8 psf.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Aluminum Doors and Frames; FIO.

Manufacturer's descriptive data and catalog cuts including air-infiltration data.

SD-04 Drawings

Aluminum Doors and Frames; GA.

A schedule showing the location of each door shall be included with the drawings. Drawings showing elevations of each door and frame type, details and method of anchorage, details of construction, location and installation of hardware, shape and thickness of materials, and details of joints and connections.

SD-06 Instructions

Installation; FIO. Cleaning; FIO.

Manufacturer's installation instructions and cleaning instructions.

SD-09 Reports

Full-Glazed and Flush Doors; FIO.

For full-glazed and flush doors, certified test reports from an independent testing laboratory, stating that doors are identical in design, materials, and construction to a door that has been tested and meets all test and specified requirements.

SD-14 Samples

Finishes; GA.

Samples of the color anodized coating, showing the extreme color range.

1.5 DELIVERY AND STORAGE

Materials delivered to the jobsite shall be inspected for damage, and shall be unloaded with a minimum of handling. Storage shall be in a dry location with adequate ventilation, free from dust, water, and other contaminants, and which permits easy access for inspecting and handling. Materials shall be neatly stored on the floor, properly stacked on nonabsorptive strips or wood platforms. Doors and frames shall not be covered with tarps, polyethylene film, or similar coverings.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one-year period shall be provided.

PART 2 PRODUCTS

2.1 ALUMINUM DOORS AND FRAMES

Extrusions shall comply with ASTM B 221, Alloy 6063-T5 except alloy used for anodized color coatings shall be required to produce the specified color. Aluminum sheets and strips shall comply with ASTM B 209, alloy and temper best suited for the purpose. Fasteners shall be hard aluminum or stainless steel.

2.1.1 Finishes

Finish shall be color anodized. Color anodized finish shall be AA-M10C22A44 in accordance with the requirements of AA DAF-45. Color shall be Color shall be in accordance with Section 09000 - BUILDING COLOR AND FINISH SCHEDULE.

2.1.2 Welding and Fastening

Where possible, welds shall be located on unexposed surfaces. Welds required on exposed surfaces shall be smoothly dressed. Welding shall produce a uniform texture and color in the finished work, free of flux and spatter. Exposed screws or bolts will be permitted only at inconspicuous locations and shall have heads countersunk.

2.1.3 Anchors

Anchors shall be stainless steel or steel with a hot-dipped galvanized finish. Anchors of the sizes and shapes required shall be provided for securing aluminum frames to adjacent construction. Anchors shall be placed 400 mm near top and bottom of each jamb and at intermediate points not more than 25 inches apart as indicated on the drawings. Transom bars shall be anchored at ends, and mullions shall be anchored at head and sill.

2.1.4 Provisions For Hardware

Hardware for aluminum doors is specified in Section 08700 BUILDERS' HARDWARE. Doors and frames shall be cut, reinforced, drilled, and tapped at the factory to receive template hardware. Reinforcement shall be provided in the core of doors as required to receive locks, door closers, and other hardware. Doors to receive surface applied hardware shall be reinforced as required.

2.1.5 Provisions For Glazing

Glazing shall be as specified in Section 08810 GLASS AND GLAZING. Metal glazing beads, vinyl inserts, and glazing gaskets shall be provided for securing glass, minumum glass bite along perimeter of frame shall be 13mm. Glass stops shall be tamperproof on exterior side.

2.1.6 Weatherstripping

Weatherstripping shall be continuous silicone-treated wool pile type, or a type recommended by the door manufacturer, and shall be provided on head and jamb of exterior doors. Weatherstripping for bottom of doors shall be as shown. Weatherstripping shall be easily replaced without special tools, and shall be adjustable at meeting stiles of pairs of doors. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.2 FABRICATION OF ALUMINUM FRAMES

Frames shall be double-glazed and shall have a minimum total average unit thermal resistance of R value 1.92. Frames shall be fabricated of extruded aluminum shapes to contours as shown on the drawings. Shapes shown are representations of design, function, and required profile. Dimensions shown are minimum. Shapes of equivalent design may be submitted, subject to approval of samples. Minimum metal wall thickness shall be 0.090 inch, except glazing beads, moldings, and trim shall be not less than 0.050 inch. Frames that are to receive glass shall have removable snap-on glass stops and glazing beads. Joints in frame members shall be milled to a hairline watertight fit, reinforced, and secured mechanically by steel clip arrangement or by screw spline attachment.

2.2.1 Horizontal Safety Rails

Rails shall be of the same style, design, and finish as the doors and frames, and shall be mounted at the same height as push-pull bars and exit devices. Rails may be on either side of the glass. The exposed vertical face shall be not less than 38 mm (1 1/2 inches) wide

2.3 FABRICATION OF ALUMINUM DOORS

2.3.1 Sizes, Clearances, and Edge Treatment

Doors shall be not less than 1-3/4 inchesthick. Clearances shall be 1/16 inch at hinge stiles, 1/8 inch at lock stiles and top rails, and 3/16 inch at floors and thresholds. Single-acting doors shall be beveled 1/8 inch at lock and meeting stile edges. Double-acting doors shall have rounded edges at hinge stile, lock stile, and meeting stile edges.

2.3.1.1 Full-Glazed Stile and Rail Doors

Doors shall have wide stiles and rails as shown, and shall be fabricated from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Doors shall be double-glazed and shall have a minimum total average unit thermal resistance of double-glazed and shall have a minimum condensation resistance factor of 45 in accordance with AAMA 1503.1. Top and bottom rail shall be fastened together by means of welding or by 3/8 inch diameter cadmium-plated tensioned steel tie rods. Extruded aluminum snap-in glazing beads shall be provided on interior side of doors. Extruded aluminum theft-proof snap-in glazing beads or fixed glazing beads shall be provided on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets, designed to receive glass of thickness required. Glass is specified in Section 08810 GLASS AND GLAZING.

PART 3 EXECUTION

3.1 INSTALLATION OF DOORS, FRAMES, AND ACCESSORIES

3.1.1 Protection of Aluminum

Aluminum shall not be used where it will be in contact with copper or where it will contact water which flows over copper surfaces. Aluminum that will be in contact with wet or pressure-treated wood, mortar, concrete, masonry, or ferrous metals shall be protected against galvanic or corrosive action by one of the following methods.

3.1.1.1 Paint

Aluminum surfaces to be protected shall be solvent cleaned and given a coat of zinc-molybdate primer and one coat of aluminum paint.

3.1.1.2 Nonabsorptive Tape or Gasket

Nonabsorptive tape or gasket shall be placed between the adjoining surfaces and shall be cemented to the aluminum surface using a cement compatible with aluminum.

3.1.2 Installation

Frames and framing members shall be accurately set in position to receive doors, transoms, and adjoining sidelights. Frames shall be plumb, square, level, and in alignment, and securely anchored to adjacent construction. Metal-to-metal joints between framing members shall be sealed as specified in Section 07900 JOINT SEALING. Doors shall be accurately hung with proper clearances, and adjusted to operate properly. Protective coverings if provided shall be removed and the doors and frames shall be thoroughly cleaned.

-- End of Section --

SECTION 08210

WOOD DOORS
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA 135.4	(1995) Basic Hardboard

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI-02	(1994) Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA LD 3	(1991) High-Pressure Decorative Laminates

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1995) Fire Doors and Windows
NFPA 101	(1997) Safety to Life from Fire in Buildings and Structures
NFPA 252	(1995) Fire Tests of Door Assemblies

NATIONAL WOOD WINDOW & DOOR ASSOCIATION (NWWDA)

NWWDA I.S. 1-A	(1993) Architectural Wood Flush Doors
NWWDA I.S. 4	(1994) Water-Repellent Preservative Non-Pressure Treatment for Millwork

1.2 GENERAL REQUIREMENTS

1.2.1 Standard Products

Doors shall be of the type, size, and design indicated on the drawings, and shall be the standard products of manufacturers regularly engaged in the manufacture of wood doors.

1.2.2 Marking

Each door shall bear a stamp, brand, or other identifying mark indicating quality and construction of the door. The identifying mark or a separate certification shall include identification of the standard on which construction of the door is based, identity of the manufacturing plant, identification of the standard under which preservative treatment, if used, was made, and identification of the doors having a Type I glue bond.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Wood Doors ;

Drawings indicating the location of each door, elevation of each type of door, details of construction, marks to be used to identify the doors, and location and extent of hardware blocking. Drawings shall include catalog cuts or descriptive data for doors, weatherstripping, flashing, and thresholds to be used.

SD-06 Instructions

Wood Doors;

Manufacturers preprinted installation and touch-up instructions.

SD-13 Certificates

Wood Doors; Adhesives;

Certificate stating that adhesives used for proposed doors do not contain any formaldehyde.

SD-14 Samples

Factory Coated Natural Finish; Factory Coated Paint Finish;

Samples of factory applied natural finish.

1.4 STORAGE

Doors shall be stored in fully covered areas and protected from damage and from extremes in temperature and humidity. Doors shall be stored on supports to prevent warping or twisting, and to provide ventilation. Factory cartons or wrappers shall be kept intact until installation.

1.5 HARDWARE

Hardware, including weatherstripping and thresholds, is specified in Section 08700 BUILDERS' HARDWARE.

1.6 GLAZING

Glazing is specified in Section 08810 GLASS AND GLAZING.

1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period shall be provided.

PART 2 PRODUCTS

2.1 GENERAL FABRICATION REQUIREMENTS

2.1.1 Edge Sealing

Wood end-grain exposed at edges of doors shall be sealed prior to shipment.

2.1.2 Preservative Treatment

Exterior softwood doors shall be water-repellent preservative treated in accordance with NWWDA I.S. 4.

2.1.3 Adhesives

Adhesives shall be in accordance with NWWDA I.S. 1-A, requirements for Type I Bond Doors (waterproof) for exterior doors and requirements for Type II Bond Doors (water-repellent) for interior doors. Adhesive for doors to receive a transparent finish shall be nonstaining. Adhesives shall contain no formaldehydes.

2.1.4 Prefitting

Doors shall be furnished pre fitted or unfitted at the option of the Contractor.

2.2 FLUSH DOORS

Flush doors shall be solid core and shall conform to NWWDA I.S. 1-A, except for the one year acclimatization requirement in paragraph T-2, which shall not apply. Wood doors shall be 5-ply construction with faces, stiles, and rails bonded to the cores.

2.2.1 Core Construction

2.2.1.1 Solid Cores

Door construction shall be glued wood block core with vertical and horizontal edges bonded to the core. Blocking and hardware reinforcements shall be in accordance with NWWDA I.S. 1-A.

2.2.2 [Enter Appropriate Subpart Title Here]2.2.2.1 Natural Finished Wood Veneer Doors

Veneer doors to receive natural finish shall be Premium Grade, plain sliced red oak veneer in accordance with NWWDA I.S. 1-A. Vertical stile strips shall be selected to provide edges of the same species and color as the face veneer. Door finish shall be in accordance with paragraph FINISHING.

2.3 [Enter Appropriate Subpart Title Here]2.4 2.4.1 [Enter Appropriate Subpart Title Here]

2.5 FINISHING

2.5.1 Factory Coated Natural Finish

Doors indicated to receive factory coated natural finish shall be given a transparent finish conforming to AWI-02, Section 1500, Premium Grade, light stain, dull rubbed sheen, open grain effect. Finish shall be AWI factory

finish system Number TR3 or TR4. Color of the natural finish shall be in accordance with Section 09915: COLOR SCHEDULE. Edges of unfitted doors shall be field finished after fitting to the frames.

PART 3 EXECUTION

3.1 INSTALLATION OF DOORS

3.1.1 General Use Doors

Doors shall be fit, hung, and trimmed as required. Door shall have a clearance of 1/8 inch at the sides and top and shall have a bottom clearance of 1/4 inch over thresholds and 1/2 inch at other locations unless otherwise shown. The lock edge or both edges of doors shall be beveled at the rate of 1/8 inchin 2 inches. Cuts made on the job shall be sealed immediately after cutting, using a clear varnish or sealer. Bottom of doors shall be undercut to allow clear door swing over carpeted areas. Vertical edges of doors which have not been rounded or beveled at the factory shall be eased when the doors are installed.

3.1.2

-- End of Section --

SECTION 08700

BUILDERS' HARDWARE
08/2002
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA L & R Directory	(Effective thru Jun 1999) Directory of Certified Locks & Latches
BHMA Closer Directory	(Effective thru Jul (1999) Directory of Certified Door Closers
BHMA Exit Devices Directory	(Effective thru Aug 1998) Directory of Certified Exit Devices
BHMA A156.1	(1997) Butts and Hinges
BHMA A156.2	(1996) Bored and Preassembled Locks and Latches
BHMA A156.3	(1994) Exit Devices
BHMA A156.4	(1992) Door Controls - Closers
BHMA A156.5	(1992) Auxiliary Locks & Associated Products
BHMA A156.6	(1994) Architectural Door Trim
BHMA A156.7	(1997) Template Hinge Dimensions
BHMA A156.13	(1994) Mortise Locks & Latches
BHMA A156.16	(1989) Auxiliary Hardware
BHMA A156.18	(1993) Materials and Finishes
BHMA A156.19	(1997) Power Assist and Low Energy Power Operated Doors
BHMA A156.21	(1996) Thresholds

DOOR AND HARDWARE INSTITUTE (DHI)

DHI Keying Systems	(1989) Keying Systems and Nomenclature
DHI Locations for CSD	(1997) Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames
DHI Locations for SSD	(1990) Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames
DHI ANSI/DHI A115.1G	(1994) Installation Guide for Doors and Hardware
DHI ANSI/DHI A115-W	(Varies) Wood Door Hardware Standards (Incl All5-W1 thru A115-W9)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1999) Fire Doors and Fire Windows
NFPA 101	(1997; Errata 97-1; TIA-97-1) Life Safety Code
NFPA 105	(1999) Installation of Smoke-Control Door Assemblies

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Exit Devices;
Electro-Mechanical Locks;
Electro-Magnetic Holders;
Power Assist and Low Energy Power Operators;

Detail drawings for hardware devices for computerized keying systems, magnetic cards, keyless push button access control systems, and other electrical hardware devices showing complete wiring and schematic diagrams and other details required to demonstrate proper function of units.

SD-03 Product Data

Hardware and Accessories;

Manufacturer's descriptive data, technical literature, catalog cuts, and installation instructions. Spare parts data for locksets, exit devices, closers, electric locks, electric strikes, electro-magnetic closer holder release devices, and electric exit devices, after approval of the detail drawings, and not later than 3 month(s) prior to the date of beneficial occupancy. The data

shall include a complete list of parts and supplies, with current unit prices and source of supply.

Hardware Schedule; G

Submit a hardware schedule listing all items to be furnished. See Part 1 paragraph HARDWARE SCHEDULE.

Keying; G

Keying schedule developed in accordance with DHI Keying Systems, after the keying meeting with the user.

SD-04 Samples

Locks and Latches; G.

Furnish a sample of the locksets to be furnished this project. Notify the Contracting Officer and base personnel for a meeting demonstrating that the locksets to be furnished are fully compatible with the existing keying system. An existing base core, and key will be fitted to the sample lockset. The core shall fit the lockset without the use of adaptors and without play. The key shall easily lock and unlock the lockset without binding or other difficulties. Control key shall easily remove and install cores.

Locksets; G.

Furnish a sample of the locksets to be furnished this project. Notify the Contracting Officer and base personnel for a meeting demonstrating that the locksets to be furnished are fully compatible with the existing keying system. An existing base core, and key will be fitted to the sample lockset. The core shall fit the lockset without the use of adaptors and without play. The key shall easily lock and unlock the lockset without binding or other difficulties. Control key shall easily and install cores.

SD-07 Certificates

Hardware and Accessories;

The hardware manufacturer's certificates of compliance stating that the supplied material or hardware item meets specified requirements. Each certificate shall be signed by an official authorized to certify in behalf of the product manufacturer and shall identify quantity and date or dates of shipment or delivery to which the certificates apply. A statement that the proposed hardware items appear in BHMA L & R Directory, BHMA Closer Directory and BHMA Exit Devices Directory directories of certified products may be submitted in lieu of certificates.

Furnish a separate certificate of compliance attesting that hardware items conform to the Section 00700 Contract clauses pertaining to the Buy American Act.

1.3 HARDWARE SCHEDULE

The hardware schedule shall include for each item: the quantities; manufacturer's name and catalog numbers; the ANSI number specified, sizes; detail information or catalog cuts; finishes; door and frame size and

materials; location and hardware set identification cross-references to drawings; lock trim material thicknesses; lock trim material evaluation test results; corresponding reference standard type number or function number from manufacturer's catalog if not covered by ANSI or BHMA; and list of abbreviations and template numbers.

1.4 PREDELIVERY CONFERENCE

Upon approval of the Hardware Schedule, the construction Contractor shall arrange a conference with the hardware supplier, Contracting Officer and the using agency to determine keying system requirements. Location of the key control storage system, set-up and key identification labeling will also be determined.

1.5 DELIVERY, STORAGE, AND HANDLING

Hardware shall be delivered to the project site in the manufacturer's original packages. Each article of hardware shall be individually packaged in the manufacturer's standard commercial carton or container, and shall be properly marked or labeled to be readily identifiable with the approved hardware schedule. Each change key shall be tagged or otherwise identified with the door for which its cylinder is intended. Where double cylinder functions are used or where it is not obvious which is the key side of a door, appropriate instructions shall be included with the lock and on the hardware schedule. Manufacturer's printed installation instructions, fasteners, and special tools shall be included in each package.

1.6 SPECIAL TOOLS

Special tools, such as those supplied by the manufacturer, unique wrenches, and dogging keys, shall be provided as required to adjust hardware items.

1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided.

1.8 OPERATION AND MAINTENANCE MANUALS

Six complete copies of maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides shall be provided. The instructions for electric locks, electric strikes, electro-magnetic closer holder release devices, and electric exit devices shall include simplified diagrams as installed.

PART 2 PRODUCTS

2.1 GENERAL HARDWARE REQUIREMENTS

Hardware and Accessories shall conform to the requirements specified herein and the HARDWARE SETS listing at the end of this section. Hardware set numbers correspond to the set numbers shown on the drawings.

2.2 TEMPLATES

Requirements for hardware to be mounted on metal doors or metal frames shall be coordinated between hardware manufacturer and door or frame manufacturer by use of templates and other information to establish location, reinforcement required, size of holes, and similar details. Templates of hinges shall conform to BHMA A156.7.

2.3 HINGES

Hinges shall conform to BHMA A156.1. Hinges used on metal doors and frames shall also conform to BHMA A156.7. Except as otherwise specified, hinge sizes shall conform to the hinge manufacturer's printed recommendations.

2.3.1 Hinges for Reverse Bevel Doors with Locks

Hinges for reverse bevel doors with locks shall have pins that are made nonremovable by means such as a set screw in the barrel, or safety stud, when the door is in the closed position.

2.3.2 Contractor's Option

Hinges with antifriction bearings may be furnished in lieu of ball bearing hinges, except where prohibited for fire doors by the requirements of NFPA 80.

2.3.3 Pivot Hinges

Pivot hinges shall conform to BHMA A156.4.

2.4 LOCKS AND LATCHES

To the maximum extent possible, locksets, latchsets and deadlocks, and all components thereof, including cylinders and removable cores, shall be the products of a single manufacturer. Lock fronts for double-acting doors shall be rounded.

2.4.1 Mortise Lock and Latchsets

Mortise lock, latchsets, and strikes shall be series 1000 and shall conform to BHMA A156.13, operational Grade 1. Strikes for security doors shall be rectangular without curved lip. Mortise type locks and latches for doors 1-3/4 inches thick and over shall have adjustable bevel fronts or otherwise conform to the shape of the door. Mortise locks shall have armored fronts.

2.4.2 Auxiliary Locks and Associated Products

Bored and mortise dead locks and dead latches, narrow style dead locks and dead latches, rim latches, dead latches, and dead bolts, and electric strikes shall conform to BHMA A156.5. Bolt and latch retraction shall be dead bolt style. Strike boxes shall be furnished with dead bolt and latch strikes for Grade 1. Electric strikes shall be unlocked from a remote location in fail secured mode. Electric strike for rated openings shall be fail secured.

2.4.3 Lock Cylinders (Mortise)

Lock cylinders shall comply with BHMA A156.5. Lock cylinder shall have not less than seven pins. Lock Cylinders to provide key removable core lock system (Series 1000, mortise locks only). A building master keying system shall be provided. Construction interchangeable cores shall be provided. All locksets, lockable exit devices, and padlocks shall accept same interchangeable cores.

2.4.4 Lock Trim

Lock trim shall be cast, forged, or heavy wrought construction of commercial plain design. In addition to meeting the test requirement of BHMA A156.2 or BHMA A156.13, lever handles, roses, and escutcheons shall be 0.050 inch thick, if unreinforced. If reinforced, the outer shell shall be 0.035 inch thick and the combined thickness shall be 0.070 inch except

that knob shanks shall be 0.060 inchthick. Lever handles shall be of plain design with ends returned to no more than 1/2 inch from the door face.

2.5 EXIT DEVICES AND EXIT DEVICE ACCESSORIES

Exit devices and exit device accessories shall conform to BHMA A156.3, Grade 1.

2.5.1 Exit Devices and Auxiliary Items

Trim shall be of wrought construction and commercial plain design with straight, beveled, or smoothly rounded sides, corners, and edges. Adjustable strikes shall be provided for rim type and vertical rod devices. Open back strikes shall be provided for pairs of doors with mortise and vertical rod devices; except open back strikes shall be used on labeled doors only where specifically provided for in the published listings. Touch bars shall be provided in lieu of conventional crossbars and arms. Escutcheons shall be provided not less than 7 by 2-1/4 inches. Escutcheons shall be cut to suit cylinders and operating trim.

2.5.2 Door Coordinator

Door coordinator with carry bar shall be Type 21 and shall be provided for each pair of doors equipped with an overlapping astragal. The coordinator may be mechanically operated and shall be capable of holding the active door of a pair open until the inactive door has preceded it in the closing cycle. When used as fire exit hardware, the coordinator and carry bar shall be listed or labeled by a nationally recognized independent testing laboratory.

2.5.3 Automatic Flush Bolts

Automatic flush bolts shall be Type 25 in accordance with BHMA A156.3, and shall be installed at the top and bottom of the inactive leaf of pairs of fire rated doors where specified in the hardware sets. Flush bolts shall be mortised in the strike edge of the door.

2.6 KEYING

Locks shall be keyed in sets or subsets as scheduled. Locks shall be furnished with the manufacturer's standard construction key system. Change keys for locks shall be stamped with change number and the inscription "U.S. Property - Do Not Duplicate." Keys shall be supplied as follows:

Locks:	3 change keys each lock.
Master keyed sets:	4 keys each set.
Construction keys:	6 total.
Blank keys:	150 total.

The keys shall be furnished to the Contracting Officer arranged in a container for key control system storage in sets or subsets as scheduled.

2.7 DOOR CLOSING DEVICES

Door closing devices shall conform to BHMA A156.4, Grade 1. Closing devices shall be products of one manufacturer for each type specified. The opening resistance of closing devices shall not exceed 15 1bf applied at the latch stile or exceed 5 1bfwhere low opening resistance is scheduled.

2.7.1 Surface Type Closers

Surface type closers shall be Grade 1, Series C02000 Full Cover with options PT-4H delayed action, Size 1 or 2 through Size 6 PT-4G built-in factory set dead stop, and PT-4D with back check position valve. Except as otherwise specified, sizes shall conform to the manufacturer's published recommendations. Closers for outswinging exterior doors shall have parallel arms or shall be top jamb mounted. Closers for doors close to a wall shall be of narrow projection so as not to strike the wall at the 90-degree open position. Closers on doors accessible to the physically handicapped shall have the closing force set for a push-pull of 2.27 kg (5 pounds) applied at the knob or handle for interior doors; for exterior doors, set to the minimum required to relatch the door.

2.8 POWER ASSIST AND LOW ENERGY POWER OPERATORS

Power assist and low energy power operators shall conform to BHMA A156.19 and shall be pneumatically operated.

2.9 ARCHITECTURAL DOOR TRIM

Architectural door trim shall conform to BHMA A156.6.

2.9.1 Door Protection Plates

2.9.1.1 Kick Plates

Kick plates shall be Type J102 stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. Height shall be 16 inches, except where the bottom rail is less than 16 inches the plate shall extend to within 1/2 inch of the panel mold or glass bead. Edges of plates shall be beveled.

2.9.1.2 Mop Plates

Mop plates shall be Type J103 stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. The height shall be 4 inches.Edges of plates shall be beveled.

2.9.2 Push Plates

2.9.2.1 Flat Plates

Flat plates shall be Type J301 0.50 inch thick aluminum. Edges of plates shall be beveled.

2.9.3 Door Pulls and Push/Pull Units

2.9.3.1 Door Pulls

Door pulls shall be Category J400 stainless steel of plain modern design. Pulls for hollow metal, mineral core wood or kalamein doors shall be Type J405 thru-bolted to Type J301 flat push plates.

2.9.4 Push and Pull Bars

Push and pull bars shall be Category J500, aluminum. Edges of mounting plates shall be beveled.

2.10 AUXILIARY HARDWARE

Auxiliary hardware, consisting of flushbolts, door holders, and door stops, shall conform to BHMA A156.16. Lever extension flush bolts shall be Type L14081. Dust-proof strikes shall be Type L04011 for doors that are not fire rated. Dust-proof strikes shall be Type L04021 for fire rated doors. Other auxiliary hardware of the types listed below, shall conform to BHMA A156.16.

Garment Hooks: L12131

2.11 MISCELLANEOUS

2.11.1 Metal Thresholds

Thresholds shall conform to BHMA A156.21. Thresholds for exterior doors shall be extruded aluminum of the type indicated and shall provide proper clearance and an effective seal with specified weather stripping. Where required, thresholds shall be modified to receive projecting bolts of flush bolts. Thresholds for doors accessible to the handicapped shall be beveled with slopes not exceeding 1:2 and with heights not exceeding 1/4 inch. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.11.2 Rain Drips

Extruded aluminum, not less than 0.07 inch thick, clear anodized. Door sill rain drips shall be 1-1/2 inches to 1-3/4 inches high by 5/8 inch projection. Overhead rain drips shall be approximately 1-1/2 inches high by 2-1/2 inchesprojection and shall extend 2 inches on either side of the door opening width.

2.11.3 Aluminum Housed Type Weatherseals

Weatherseals of the type indicated shall consist of extruded aluminum retainers not less than 0.07 inch wall thickness with vinyl, neoprene, silicone rubber, polyurethane or vinyl brush inserts. Aluminum shall be clear (natural) anodized. Weatherseal material shall be of an industrial/commercial grade. Seals shall remain functional through all weather and temperature conditions. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.11.4 Key Control Storage System

Key control storage system shall conform to BHMA A156.5, Type B8351, capacity as required, and shall be properly labeled for key identification. Set up, identification labeling and location of the key control storage shall be as directed at the Predelivery Conference.

2.11.5 Door Stops

Wall stops, floor stops and combination stop and holders shall conform to BHMA A156.16.

2.12 FASTENINGS

Fastenings of proper type, size, quantity, and finish shall be supplied with each article of hardware. Machine screws and expansion shields shall be used for attaching hardware to concrete or masonry. Fastenings exposed

to the weather in the finished work shall be of brass, bronze, or stainless steel. Sex bolts, through bolts, or machine screws and grommet nuts, where used on reverse-bevel exterior doors equipped with half-surface or full-surface hinges, shall employ one-way screws or other approved tamperproof screws. Screws for the jamb leaf of half-mortise and full-surface hinges attached to structural steel frames shall be one-way or other approved tamperproof type.

2.13 FINISHES

Unless otherwise specified, finishes shall conform to those identified in BHMA A156.18. Where painting of primed surfaces is required, painting is specified in Section 09900 PAINTING, GENERAL.

2.14 HARDWARE FOR FIRE DOORS

Hardware for fire doors shall conform to the requirements of NFPA 80and NFPA 101.

PART 3 EXECUTION

3.1 APPLICATION

Hardware shall be located in accordance with DHI Locations for CSD and DHI Locations for SSD, except that deadlocks shall be mounted 48 inches above finish floor. When approved, slight variations in locations or dimensions will be permitted. Application shall be in accordance with DHI ANSI/DHI A115.1G or DHI ANSI/DHI A115-W. Door control devices for exterior doors such as closers and holders, shall be attached to doors with thru bolts and nuts or sex bolts. Alternate fastening methods may be approved by the Contracting Officer when manufacturers' documentation is submitted to verify that the fastening devices and door reinforcements are adequate to resist wind induced stresses.

3.1.1 Hardware for Fire Doors and Smoke-Control Door Assemblies

Hardware for fire doors shall be installed in accordance with the requirements of NFPA 80. Exit devices installed on fire doors shall have a visible label bearing the marking "Fire Exit Hardware". Other hardware installed on fire doors, such as locksets, closers, and hinges shall have a visible label or stamp indicating that the hardware items have been approved by an approved testing agency for installation on fire-rated doors. Hardware for smoke-control door assemblies shall be installed in accordance with NFPA 105.

3.1.2 Door-Closing Devices

Door-closing devices shall be installed and adjusted in accordance with the templates and printed instructions supplied by the manufacturer of the devices. Insofar as practicable, doors opening to or from halls and corridors shall have the closer mounted on the room side of the door.

3.1.3 Key Control Storage Systems

Key control storage system shall be installed where directed.

3.1.4 Kick Plates and Mop Plates

Kick plates shall be installed on the push side of single-acting doors and

on both sides of double-acting doors. Mop plates shall be installed on the pull side of the single acting doors.

3.1.5 Auxiliary Hardware

Lever extension flush bolts shall be installed at the top and bottom of the inactive leaf of pairs of doors. The bottom bolt shall operate into a dust-proof floor strike or threshold. Floor mounted door stop risers shall be used on all door stops that are not of sufficient height to stop the door.

3.1.6 Thresholds

Thresholds shall be secured with a minimum of three fasteners per single door width and six fasteners per double door width with a maximum spacing of 12 inches. Exterior thresholds shall be installed in a bed of sealant with expansion anchors and stainless steel screws. Minimum screw size shall be No. 10 length, dependent on job conditions, with a minimum of 3/4 inchthread engagement into the floor or anchoring device used. Thresholds shall have ends scribed neately to jambs.

3.1.7 Rain Drips

Door sill rain drips shall align with the bottom edge of the door. Overhead rain drips shall align with bottom edge of door frame rabbet. Drips shall be set in sealant and fastened with stainless steel screws.

3.1.8 Weatherseals

Weatherseals shall be located as indicated, snug to door face and fastened in place with color matched metal screws after door and frames have been finish painted. Screw spacing shall be as recommended by manufacturer.

3.2 FIELD QUALITY CONTROL

Supplier shall inspect the completed installation and certify that the hardware has been furnished and installed in accordance with the manufacturers' instructions as specified. The inspection report shall identify any malfunctioning items and recommend adjustment or replacement as appropriate.

3.3 HARDWARE SETS

a. Identify each hardware set required for use on fire rated doors as "fire-rated".

HW-1

2 pr. Pivots, C07162, by door manufacturer x finish to match door.
2 ea. Intermediate pivots, C07382, by door manufacturer x finish to match door.
1 ea. Exit device, type [AM#1] 1, function 08 (cylinder dogging) x RHR x 630
1 ea. Exit device, type [AM#1] 1, function 02 (cylinder dogging) x trim to match active door x 630[AM#1], with keyed removable mullion
[AM#1]2 ea. Pull bar by door manufacturer x factory finish to match doors.
2 ea. Closers, C02041 x finish to match doors.
2 ea. Overhead stop, C12541 x 626
1 ea. Threshold, J32190 as detailed x 628
[AM#1]2 set Weatherstripping, at head, jambs and meeting stiles.
[AM#1]2 ea. Door sweep, R3C415 x 628

HW-2 [AM#1] DELETED

[AM#1] HW-2

4 pr. Hinges, A2112 x 626
1 ea. Exit device, Type 1, Function 08 (Cylinder dogging) x RHR 630
1 ea. Exit device, Type 1, Function 02 (Cylinder dogging) x Trim to match active door x 630 with keyed removable mullion
2 ea. Closers, C02021, PT-8C x 689 (Provide adaptor needed to allow for clearance of overhead holder).
2 ea. Kick Plates, J102 x 630
2 ea. Overhead Stops, C12541 x 626
2 set Weatherstripping, at head, jambs.
1 ea. Threshold, J33130 as detailed x 628
2 set Rain drip & Head and door bottom x 628
2 ea. Door sweep, R3C415 x 628

HW-3

3 [AM#1] pr. Hinges, A511 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Pull Plate, J407 x 630
1 ea. Push Plate, J304 x 630
1 ea. Closers, C02021 x 6[AM#1]30
[AM#1]2 ea. Kick Plates, J102 x 630
1 ea. Stops, L12141 x 626
[AM#1] _____
1 ea. Threshold, J32120 x 630

HW-4

[AM#1] 4 pr. Hinges, A511 x 630
1 ea. Lockset, F07 Grade 1 x 630
1 ea. Closers, C02021 x 689 (Provide adaptor needed to allow for clearance of overhead holder).
1 ea. Kick Plates, J102 x 630
1 ea. Overhead stops, C12541 x 626
1 ea. Mop Plate, J103 x 630
1 ea. Threshold, J33130 as detailed x marble

HW-5

3 pr. Hinges, A511 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F07 Grade 1 x 626
2 ea. Closers, C02021, PT-4G x 689
1 set Self latching extension flush bolt set (Type 27) x 626
2 ea. Kick Plates, J102 x 630
2 ea. Stops, L12131 x 626
1 ea. Dustproof strike, L04021 x 626

HW-6

3 [AM#1]pr. Hinges, A2112 x 626 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F07 Grade 1 x 626
1 ea. Closers, C02021, PT-8C x 689 (Provide adaptor needed to allow for clearance of overhead holder).
1 ea. Kick Plates, J102 x 630
1 ea. Overhead Stops, C12541 x 626
1 set Weatherstripping, at head, jambs.
1 ea. Threshold, J33130 as detailed x 628
1 set Rain drip & Head and door bottom x 628
1 ea. Door sweep, R3C415 x 628

HW-7

3 [AM#1]pr. Hinges, A2112 x 626 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F07 Grade 1 x 626
1 ea. Closers, C02011 x 689
1 ea. Kick Plates, J102 x 630
1 ea. Stop, L12141 x 626

HW-8

3 ea. Hinges, A2112 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F05 Grade 1 x 626
1 ea. Stops, L12141 x 626

HW-9 [AM#1] DELETED

[AM#1]HW-9 (Fire Rated)

4 pr. Hinges, A2112 x 626
1 ea. Exit device, Type 1, Function 08 (Cylinder dogging) x RHR 630
1 ea. Exit device, Type 1, Function 02 (Cylinder dogging) x Trim to match active door x 630 with keyed removable mullion
2 ea. Closers, C02021, PT-8C x 689 (Provide adaptor needed to allow for clearance of overhead holder).
2 ea. Kick Plates, J102 x 630
2 ea. Overhead Stops, C12541 x 626
2 set Weatherstripping, at head, jambs.
1 ea. Threshold, J33130 as detailed x 628
2 ea. Door sweep, R3C415 x 628

HW-10

3 [AM#1]pr. Hinges, A511 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F19 Grade 1 x 630
1 ea. Closers, C02011 x 689
1 ea. Kick Plates, J102 x 630
1 ea. Stops, L12161 x 626
1 ea. Threshold, J32120 x 630
1 ea. Garment Hook, L12131 x 630

HW-11

3 [AM#1]pr. Hinges, A2112 x 626 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F01 Grade 1 x 626
1 ea. Stops, L12161 x 626
1 ea. Threshold, J32120 x 628

HW-12 (Fire Rated)

3 [AM#1]pr. Hinges, A511 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Exit device, type 1, function 08 x 630
1 ea. Closers, C02041 x finish to match door (Provide adaptor needed to allow for clearance of overhead holder).
1 ea. Kick Plates, J102 x 630
1 ea. Overhead Stops, C12541 x 626
1 ea. Threshold, J32120 x as detailed x marble

HW-13

3 [AM#1]pr. Hinges, A2112 x 626 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F04 Grade 1 x 626

1 set Weatherstripping, at head, jambs.
1 ea. Threshold, J32120 x 628
1 ea. Door shoe, R3D535 x 628
1 ea. Overhead stop, C18541 x 626
1 set Rain drip & Head and door bottom

HW-14

[AM#1]4 pr. Hinges, A2112 x 630
1 ea. Lockset F04 Grade 1 x 626
[AM#1]
[AM#1]1 set Surface mounted manual flushbolts top & bottom of inactive leaf on the inside
2 ea. Overhead stop, C18541 x 626
1 ea. Dustproof strike, L04021 x 626
1 ea. Closers, C02021 x 689
1 ea. Threshold, J32190 as detailed x 628
1 set Weatherstripping, at head, jambs and meeting stiles.
1 set Rain drip & Head and door bottom x 628
1 ea. Door sweep, R3C415 x 628
[AM#1]2 set Door stop with hook holder on exterior

HW-15 [AM#1] DELETED

HW-16 [AM#1](Fire Rated)

3 ea. Hinges, A2112 x 630 [AM#1](4 pr. for doors 7'6" or taller)
1 ea. Lockset F07 Grade 1 x 626
1 ea. Stops, L12141 x 626

[AM#1]

-- End of Section --

SECTION 13110A

CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)
08/03
AMENDMENT NO. 0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 418	(1995a) Cast and Wrought Galvanic Zinc Anodes
ASTM B 843	(1993; R 1998) Magnesium Alloy Anodes for Cathodic Protection
ASTM D 1248	(1998) Polyethylene Plastics Molding and Extrusion Materials

NACE INTERNATIONAL (NACE)

NACE RP0169	(1996) Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0177	(1995) Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
NACE RP0188	(1999) Discontinuity (Holiday) Testing of Protective Coatings
NACE RP0190	(1995) External Protective Coatings for Joints, Fittings, and Valves on Metallic Underground or Submerged Pipelines and Piping Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA TC 2	(1998) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA WC 5	(1992; Rev 2, 1996) Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 6	(1997) Rigid Metal Conduit
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Drawings;

Six copies of detail drawings consisting of a complete list of equipment and material including manufacturer's descriptive and technical literature, catalog cuts, results of system design calculations including soil-resistivity, installation instructions and certified test data stating the maximum recommended anode current output density and the rate of gaseous production if any at that current density. Detail drawings shall contain complete wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will function properly as a unit.

Contractor's Modifications; G, RE

Six copies of detail drawings showing proposed changes in location, scope of performance indicating any variations from, additions to, or clarifications of contract drawings. The drawings shall show proposed changes in anode arrangement, anode size and number, anode materials and layout details, conduit size, wire size, mounting details, wiring diagram, method for electrically-isolating each pipe, and any other pertinent information to proper installation and performance of the system.

SD-03 Product Data

Equipment;

Within 30 days after receipt of notice to proceed, an itemized list of equipment and materials including item number, quantity, and manufacturer of each item. The list shall be accompanied by a description of procedures for each type of testing and adjustments, including testing of coating for thickness and holidays. Installation of materials and equipment shall not commence until this submittal is approved.

Spare Parts;

Spare parts data for each different item of material and equipment specified, after approval of detail drawings and not later than six (6) months prior to the date of beneficial occupancy. The data shall include a complete list of parts, special tools, and supplies, with current unit prices and source of supply. One (1) spare anode of each type shall be furnished.

SD-06 Test Reports

Tests and Measurements;

Test reports in booklet form tabulating all field tests and measurements performed, upon completion and testing of the installed system and including close interval potential survey, casing and interference tests, final system test verifying protection, insulated joint and bond tests, and holiday coating test. A certified test report showing that the connecting method has passed a 120-day laboratory test without failure at the place of connection, wherein the anode is subjected to maximum recommended current output while immersed in a three percent sodium chloride solution.

Contractor's Modifications; G, RE

Final report regarding Contractor's modifications. The report shall include pipe-to-soil measurements throughout the affected area, indicating that the modifications improved the overall conditions, and current measurements for anodes. The following special materials and information are required: taping materials and conductors; zinc grounding cell, installation and testing procedures, and equipment; coating material; system design calculations for anode number, life, and parameters to achieve protective potential; backfill shield material and installation details showing waterproofing; bonding and waterproofing details; insulated resistance wire; exothermic weld equipment and material.

SD-07 Certificates

Cathodic Protection System;

Proof that the materials and equipment furnished under this section conform to the specified requirements contained in the referenced standards or publications. The label or listing by the specified agency will be acceptable evidence of such compliance.

Services of "Corrosion Expert"; G, RE

Evidence of qualifications of the "corrosion expert."

a. The "corrosion expert's" name and qualifications shall be certified in writing to the Contracting Officer prior to the start of construction.

b. Certification shall be submitted giving the name of the firm, the number of years of experience, and a list of not less than five (5) of the firm's installations three (3) or more years old that have been tested and found satisfactory.

SD-10 Operation and Maintenance Data

Cathodic Protection System;

Before final acceptance of the cathodic protection system, six copies of operating manuals outlining the step-by-step procedures required for system startup, operation, adjustment of current flow, and shutdown. The manuals shall include the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and their basic operating features.

Six copies of maintenance manual, listing routine maintenance procedures, recommendation for maintenance testing, possible breakdowns and repairs, and troubleshooting guides. The manuals shall include single-line diagrams for the system as installed; instructions in making pipe-to-reference cell and tank-to-reference cell potential measurements and frequency of monitoring; instructions for dielectric connections, interference and sacrificial anode bonds; instructions shall include precautions to ensure safe conditions during repair of pipe or other metallic systems. The instructions shall be neatly bound between permanent covers and titled "Operating and Maintenance Instructions." These instructions shall be submitted for the Contracting Officer's approval. The instructions shall include the following:

a. As-built drawings, to scale of the entire system, showing the locations of the piping, location of all anodes and test stations, locations of all insulating joints, and structure-to-reference cell potentials as measured during the tests required by Paragraph: TESTS AND MEASUREMENTS, of this section.

b. Recommendations for maintenance testing, including instructions in making pipe-to-reference cell potential measurements and frequency of testing.

c. All maintenance and operating instructions and nameplate data shall be in English.

d. Instructions shall include precautions to insure safe conditions during repair of pipe system.

Training Course;

The proposed Training Course Curriculum (including topics and dates of discussion) indicating that all of the items contained in the operating and maintenance instructions, as well as demonstrations of routine maintenance operations, including testing procedures included in the maintenance instructions, are to be covered.

1.3 GENERAL REQUIREMENTS

The Contractor shall furnish and install a complete, operating, sacrificial anode cathodic protection system in complete compliance with NFPA 70, with all applicable Federal, State, and local regulations and with minimum requirements of this contract. The services required include planning, installation, adjusting and testing of a cathodic protection system, using sacrificial anodes for cathodic protection of the metallic Water, Fire Protection, and Gas lines; their connectors, and lines under the slab or floor foundation. The cathodic protection system shall include anodes, cables, connectors, corrosion protection test stations, and any other equipment required for a complete operating system providing the NACE criteria of protection as specified. Insulators are required whenever needed to insulate the pipes from any other structure. The cathodic protection shall be provided on metallic Water, Fire Protection, and Gas pipes.

1.3.1 Services of "Corrosion Expert"

The Contractor shall obtain the services of a "corrosion expert" to supervise, inspect, and test the installation and performance of the

cathodic protection system. "Corrosion expert" refers to a person, who by thorough knowledge of the physical sciences and the principles of engineering and mathematics, acquired by professional education and related practical experience, is qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. Such a person must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection (CP) Specialist or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metallic piping and tank systems, if such certification or licensing includes 5 years experience in corrosion control on underground metallic surfaces of the type under this contract. The "corrosion expert" shall make at least 3 visits to the project site. The first of these visits shall include obtaining soil resistivity data, acknowledging the type of pipeline coatings to be used and reporting to the Contractor the type of cathodic protection required. Once the submittals are approved and the materials delivered, the "corrosion expert" shall revisit the site the ensure the Contractor understands installation practices and laying out the components. The third visit shall involve testing the installed cathodic protection systems and training applicable personnel on proper maintenance techniques. The "corrosion expert" shall supervise installation and testing of all cathodic protection.

1.3.2 Contractor's Modifications

The specified system is based on a complete system with magnesium sacrificial anodes. The Contractor may modify the cathodic protection system after review of the project, site verification, and analysis, if the proposed modifications include the anodes specified and will provide better overall system performance. The modifications shall be fully described, shall be approved by the Contracting Officer's representative, and shall meet the following criteria. The proposed system shall achieve a minimum pipe-to-soil "instant off" potential of minus 850 millivolts with reference to a saturated copper-copper sulfate reference cell on the underground components of the piping or other metallic surface. The Contractor shall take resistivity measurements of the soil in the vicinity of the pipes and ground bed sites. Based upon the measurements taken, the current and voltage shall be required to produce a minimum of minus 850 millivolts "instant off" potential between the structure being tested and the reference cell. This potential shall be obtained over 95 percent of the metallic area. The anode system shall be designed for a life of twenty-five (25) years of continuous operation.

1.3.3 Isolators

Isolators are required to insulate the indicated pipes from any other structure.

1.3.4 Anode and Bond Wires

Magnesium anodes shall be provided [AM#1]_____as required elsewhere in this specification. These anodes shall be in addition to anodes for the pipe under concrete slab and casing requirements. For each cathodic system, the metallic components and structures to be protected shall be made electrically continuous. This shall be accomplished by installing bond wires between the various structures. Bonding of existing buried structures may also be required to preclude detrimental stray current effects and safety hazards. Provisions shall be included to return stray current to its source without damaging structures intercepting the stray current. The electrical isolation of underground facilities in accordance with acceptable industry practice shall be included under this

section. All tests shall be witnessed by the Contracting Officer.

1.3.5 Summary of Services Required

The scope of services shall include, but shall not be limited to, the following:

a. Close-interval potential surveys.

b. Cathodic Protection Systems.

c. System testing.

d. Casing corrosion control.

e. Interference testing.

f. Training.

g. Operating and maintenance manual.

h. Insulator testing and bonding testing.

i. Coating and holiday testing shall be submitted within 45 days of notice to proceed.

1.3.6 Nonmetallic Pipe System

In the event pipe other than metallic pipe is approved and used in lieu of metallic pipe, all metallic components of this pipe system shall be protected with cathodic protection. Detailed drawings of cathodic protection for each component shall be submitted to the Contracting Officer for approval within 45 days after date of receipt of notice to proceed, and before commencement of any work.

1.3.6.1 Coatings

Coatings for metallic components shall be as required for metallic fittings. Protective covering (coating and taping) shall be completed and tested on each metallic component (such as valves, hydrants and fillings). This covering shall be as required for underground metallic pipe. Each test shall be witnessed by the Contracting Officer. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified in these specifications. The use of nonmetallic pipe does not change other requirements of the specifications. Any deviations due to the use of nonmetallic pipe shall be submitted for approval.

1.3.6.2 Tracer Wire

When a nonmetallic pipe line is used to extend or add to an existing metallic line, an insulated No. 8 AWG copper wire shall be thermit-welded to the existing metallic line and run the length of the new nonmetallic line. This wire shall be used as a locator tracer wire and to maintain continuity to any future extensions of the pipe line.

1.3.7 Tests of Components

A minimum of four (4) tests shall be made at each metallic component in the piping system. Two (2) measurements shall be made directly over the anodes and the other two (2) tests shall be over the outer edge of the component, but at the farthest point from the anodes. Structure and pipes shall be shown with the cathodic protection equipment. All components of the

cathodic protection system shall be shown on drawings, showing their relationship to the protected structure or component. A narrative shall describe how the cathodic protection system will work and provide testing at each component. Components requiring cathodic protection shall include but not be limited to the following:

a. Pipes under the floor slab or foundations.

b. PIV.

c. Shutoff valves.

d. Metallic pipe extended from aboveground locations.

e. Each connector or change-of-direction device.

f. Any metallic pipe component or section.

g. Backflow preventor.

h. Culvert.

1.3.8 Drawings

Detailed drawings shall be provided showing location of anodes, insulated fittings, test stations, permanent reference cells, and bonding. Locations shall be referenced to two (2) permanent facilities or mark points.

1.3.9 Electrical Potential Measurements

All potential tests shall be made at a minimum of 10 foot intervals witnessed by the Contracting Officer. Submittals shall identify test locations on separate drawing, showing all metal to be protected and all cathodic protection equipment. Test points equipment and protected metal shall be easily distinguished and identified.

1.3.10 Achievement of Criteria for Protection

All conductors, unless otherwise shown, shall be routed to or through the test stations. Each system provided shall achieve a minimum pipe-to-soil "instant off" potential of minus 850 millivolt potentials with reference to a saturated copper-copper-sulfate reference cell on all underground components of the piping. Based upon the measurements taken, the current and voltage of the anodes should be adjusted as required to produce a minimum of minus 850 millivolts "instant off" potential between the structure being tested and the reference cell. This potential should be obtained over 95 percent of the metallic area. This must be achieved without the "instant off" potential exceeding 1150 millivolts. Testing will be witnessed by the Contracting Officer. Additional anodes shall be provided by the Contractor if required to achieve the minus 850 millivolts "instant off". Although acceptance criteria of the cathodic protection systems are defined in NACE RP0169, for this project the "instant off" potential of minus 850 millivolts is the only acceptable criteria.

1.3.11 Metallic Components and Typicals

a. Metallic components: As a minimum, each metallic component shall be protected with two (2) magnesium anodes. This number of anodes is required to achieve minus 850 millivolts "instant off" potential on the metallic area and at the same time not provide overvoltage above 1150 millivolts "instant off." The magnesium anode unpackaged weight shall be 9 pounds. The magnesium anodes shall be located on each side of the

metallic component and routed through a test station.

b. Fire Hydrants: Fire hydrant pipe components shall have a minimum of two (2) anodes. These magnesium anodes shall have an unpackaged weight of 17 pounds.

c. Pipe Under Concrete Slab: Pipe under concrete slab shall have a minimum of 1 magnesium anode. These magnesium anodes shall have an unpackaged weight of 17 pounds. Pipe under concrete slab shall have 1 permanent reference electrodes located under the slab. One (1) permanent reference electrode shall be located where the pipe enters the concrete slab. All conductors shall be routed to a test station.

d. Valves: Each valve shall be protected with 1 magnesium anodes. The magnesium anode shall have an unpackaged weight of 9 pounds.

e. Connectors or Change-of-Direction Devices: Each change-of-direction device shall be protected with 1 magnesium anodes. The magnesium anode shall have an unpackaged weight of 9 pounds.

1.3.12 Metallic Component Coating

Coatings for metallic components shall be as required for metallic fittings as indicated. This will include fire hydrants, T's, elbows, valves, etc. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified in these specifications.

PART 2 PRODUCTS

2.1 MAGNESIUM ANODES

Anodes shall be installed on the Pipe system as [AM#1]_____specified in other paragraphs of this section. See Paragraph METALLIC COMPONENTS AND TYPICALS for additional anodes under slab.

2.1.1 Anode Composition

Anodes shall be of high-potential magnesium alloy, made of primary magnesium obtained from sea water or brine, and not made from scrap metal. Magnesium anodes shall conform to ASTM B 843 and to the following analysis (in percents) otherwise indicated:

Aluminum, max.	0.010
Manganese, max.	0.50 to 1.30
Zinc	0.05
Silicon, max.	0.05
Copper, max.	0.02
Nickel, max.	0.001
Iron, Max.	0.03
Other impurities, max.	0.05 each or 0.3 max. total
Magnesium	Remainder

The Contractor shall furnish spectrographic analysis on samples from each heat or batch of anodes used on this project.

2.1.2 Dimensions and Weights

Dimensions and weights of anodes shall be approximately as follows:

TYPICAL MAGNESIUM ANODE SIZE

(Cross sections may be round, square, or D shaped)

NOMINAL WT. LBS.	APPROX. SIZE (IN)	NOMINAL GROSS WT lb PACKAGED IN BACKFILL	NOMINAL PACKAGE DIMENSIONS (IN)
9	3 X 3 X 14	27	5-1/4 X 20
17	4 X 4 X 17	45	7-1/2 X 24

2.1.3 Packaged Anodes

Anodes shall be provided in packaged form with the anode surrounded by specially-prepared quick-wetting backfill and contained in a water permeable cloth or paper sack. Anodes shall be centered by means of spacers in the backfill material. The backfill material shall have the following composition, unless otherwise indicated:

Material	Approximate Percent by Weight
Gypsum	75
Bentonite	20
Sodium Sulphate	5
Total	100

2.1.4 Connecting Wire

2.1.4.1 Wire Requirements

Wire shall be No. 12 AWG solid copper wire, not less than 10 feet long, unspliced, complying with NFPA 70, Type TW insulation. Connecting wires for magnesium anodes shall be factory installed with the place or emergence from the anode in a cavity sealed flush with a dielectric sealing compound.

2.2 MISCELLANEOUS MATERIALS

2.2.1 Electrical Wire

Wire shall be No. 12 AWG stranded copper wire with NFPA 70, Type TW insulation.

2.2.1.1 Wire Splicing

Connecting wire splicing shall be made with copper compression connectors or exothermic welds, following instructions of the manufacturer. Single split-bolt connections shall not be used. Sheaths for encapsulating electrical wire splices to be buried underground shall fit the insulated wires entering the spliced joints and epoxy potting compound shall be as specified below.

2.2.1.2 Test Wires

Test wires shall be AWG No. 12 stranded copper wire with NFPA 70, Type TW insulation.

2.2.1.3 Resistance Wire

Resistance wire shall be AWG No. 16 or No. 22 nickel-chromium wire.

2.2.2 Conduit

Rigid galvanized steel conduit and accessories shall conform to UL 6. Non metallic conduit shall conform to NEMA TC 2.

2.2.3 Test Boxes and Junctions Boxes

Boxes shall be outdoor type conforming to UL 514A.

2.2.4 Joint, Patch, Seal, and Repair Coating

Sealing and dielectric compound shall be a black, rubber based compound that is soft, permanently pliable, tacky, moldable, and unbacked. Compound shall be applied as recommended by the manufacturer, but not less than 1/2-inch thick. Coating compound shall be cold-applied coal-tar base mastic . Pressure-sensitive vinyl plastic electrical tape shall conform to UL 510.

2.2.5 Backfill Shields

Shields shall consist of approved pipeline wrapping or fiberglass-reinforced, coal-tar impregnated tape, or plastic weld caps, specifically made for the purpose and installed in accordance with the manufacturer's recommendations. When joint bonds are required, due to the use of mechanical joints, the entire joint shall be protected by the use of a kraft paper joint cover. The joint cover shall be filled with poured-in, hot coat-tar enamel.

2.2.6 Epoxy Potting Compound

Compound for encapsulating electrical wire splices to be buried underground shall be a two package system made for the purpose.

2.2.7 Test Stations

Stations shall be of the flush-curb-box type and shall be the standard product of a recognized manufacturer. Test stations shall be complete with an insulated terminal block having the required number of terminals. The test station shall be provided with a lockable over and shall have an embossed legend, "C.P. Test." A minimum of six (6) terminals shall be provided in each test station. A minimum of two (2) leads are required to the metallic pipe from each test station. Other conductors shall be provided for each anode, other foreign pipe, and reference cells as required. Test stations may be constructed of nonmetallic materials. However, if nonmetallic materials are utilized, as a minimum, the materials shall be resistant to damage from ultraviolet radiation, contain good color retention qualities, contain high strength qualities, and be resistant to accidental or vandalistic impacts that might be normally encountered in the environment for which they are to be installed. The test stations shall be listed for the particular application for which they are to be utilized.

2.2.8 Joint and Continuity Bonds

Bonds shall be provided across all joints in the metallic water andgas lines, across any electrically discontinuous connections and all other pipes and structures with other than welded or threaded joints that are included in this cathodic protection system. Unless otherwise specified in the specifications, bonds between structures and across joints in pipe with other than welded or threaded joints shall be No. 8 AWG stranded copper cable with polyethylene insulation. Bonds between structures shall contain sufficient slack for any anticipated movement between structures. Bonds across pipe joints shall contain a minimum of 4 inches of slack to allow

for pipe movement and soil stress. Bonds shall be attached by exothermic welding. Exothermic weld areas shall be insulated with coating compound and approved, and witnessed by the Contracting Officer. Continuity bonds shall be installed as necessary to reduce stray current interference. Additional joint bondings shall be accomplished by the Contractor where the necessity is discovered during construction or testing or where the Contracting Officer's representative directs that such bonding be done. Joint bonding shall include all associated excavation and backfilling. There shall be a minimum of two (2) continuity bonds between each structure and other than welded or threaded joints. The Contractor shall test for electrical continuity across all joints with other than welded or threaded joints and across all metallic portions or components. The Contractor shall provide bonding as required and as specified above until electrical continuity is achieved. Bonding test data shall be submitted for approval.

2.2.9 Resistance Bonds

Resistance bonds should be adjusted as outlined in this specification. Alternate methods may be used if they are approved by the Contracting Officer.

2.2.10 Stray Current Measurements

Stray current measurements should be performed at each test station. Stray currents resulting from lightning or overhead alternating current (AC) power transmission systems shall be mitigated in accordance with NACE RP0177.

2.2.11 Electrical Isolation of Structures

As a minimum, isolating flanges or unions shall be provided at the following locations:

a. Connection of new metallic piping or components to existing piping.

b. Pressure piping under floor slab to a building.

Isolation shall be provided at metallic connection of all lines to existing system and where connecting to a building. Additionally, isolation shall be provided between water and/or gas line; and foreign pipes that cross the new lines within 10 feet. Isolation fittings, including isolating flanges and couplings, shall be installed aboveground or in a concrete pit.

2.2.11.1 Electrically Isolating Pipe Joints

Electrically isolating pipe joints shall be of a type that is in regular factory production.

2.2.11.2 Electrically Conductive Couplings

Electrically conductive couplings shall be of a type that has a published maximum electrical resistance rating given in the manufacturer's literature. Cradles and seals shall be of a type that is in regular factory production made for the purpose of electrically insulating the carrier pipe from the casing and preventing the incursion of water into the annular space.

2.2.11.3 Insulating Joint Testing

A Model 601 Insulation Checker, as manufactured by "Gas Electronics", , or an approved equal, shall be used for insulating joint (flange) electrical testing.

2.2.12 Underground Structure Coating

This coating specification shall take precedence over any other project specification and drawing notes, whether stated or implied, and shall also apply to the pipeline supplier. No variance in coating quality shall be allowed by the Contractor or Base Construction Representative without the written consent of the designer. All underground metallic pipelines to be cathodically protected shall be afforded a good quality factory-applied coating. This includes all carbon steel, cast-iron and ductile-iron pipelines or vessels. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified. If non-metallic pipelines are installed, all metallic fittings on pipe sections shall be coated in accordance with this specification section.

a. The nominal thickness of the metallic pipe joint or other component coating shall be 8 mils, plus or minus 5 percent.

b. Pipe and joint coating for factory applied or field repair material shall be applied as recommended by the manufacturer and shall be one of the following:

(1) Continuously extruded polyethylene and adhesive coating system.
(2) Polyvinyl chloride pressure-sensitive adhesive tape.
(3) High density polyethylene/bituminous rubber compound tape.
(4) Butyl rubber tape.
(5) Coal tar epoxy.

2.2.12.1 Field Joints

All field joints shall be coated with materials compatible with the pipeline coating compound. The joint coating material shall be applied to an equal thickness as the pipeline coating. Unbonded coatings shall not be used on these buried metallic components. This includes the elimination of all unbonded polymer wraps or tubes. Once the pipeline or vessel is set in the trench, an inspection of the coating shall be conducted. This inspection shall include electrical holiday detection. Any damaged areas of the coating shall be properly repaired. The Contracting Officer shall be asked to witness inspection of the coating and testing using a holiday detector.

2.2.12.2 Inspection of Pipe Coatings

Any damage to the protective covering during transit and handling shall be repaired before installation. After field coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current in accordance with NACE RP0188 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. All holidays in the protective covering shall be repaired immediately upon detection. Occasional checks of holiday detector potential will be made by the Contracting Officer's representative to determine suitability of the detector. All labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor.

Ferrous surfaces: Shop-primed surfaces shall be touched-up with ferrous metal primer. Surfaces that have not been shop-primed shall be solvent-cleaned. Surfaces that contain loose rust, loose mil scale, and other foreign substances shall be mechanically-cleaned by power wire-brushing and primed with ferrous metal primer. Primed surface shall

be finished with two (2) coats of exterior oil paint and vinyl paint. Coating for each entire piping service shall be an approved pipe line wrapping having a minimum coating resistance of 50,000 Ohms per square foot.

2.2.13 Resistance Wire

Wire shall be No. 16 or No. 22 nickel-chromium wire with TW insulation.

2.2.14 Electrical Connections

Electrical connections shall be done as follows:

a. Exothermic welds shall be "Cadweld"," Bundy", "Thermoweld" or an approved equal. Use of this material shall be in strict accordance with the manufacturer's recommendations.

b. Electrical-shielded arc welds shall be approved for use on steel pipe by shop drawing submittal action.

c. Brazing shall be as specified in Paragraph: Lead Wire Connections.

2.2.15 Electrical Tape

Pressure-sensitive vinyl plastic electrical tape shall conform to UL 510.

2.2.16 Permanent Reference Electrodes

Permanent reference electrodes shall be Cu-CuS04 electrodes suitable for direct burial. Electrodes shall be guaranteed by the supplier for 15 years' service in the environment in which they shall be placed. Electrodes shall be installed directly beneath pipe, or metallic component.

PART 3 EXECUTION

3.1 CRITERIA OF PROTECTION

Acceptance criteria for determining the adequacy of protection on a buried underground pipe and metallic component shall be in accordance with NACE RP0169 and as specified below.

3.1.1 Iron and Steel

The following method (a) shall be used for testing cathodic protection voltages. If more than one method is required, method (b) shall be used.

a. A negative voltage of at least minus 850 millivolts as measured between the underground component and a saturated copper-copper sulphate reference electrode connecting the earth (electrolyte) directly over the underground component. Determination of this voltage shall be made with the cathodic protection system in operation. Voltage drops shall be considered for valid interpretation of this voltage measurement. A minimum of minus 850 millivolts "instant off" potential between the underground component being tested and the reference cell shall be achieved over 95 percent of the area of the structure. Adequate number of measurements shall be obtained over the entire structure, pipe, tank, or other metallic component to verify and record achievement of minus 850 millivolts "instant off." This potential shall be obtained over 95 percent of the total metallic area without the "instant off" potential exceeding 1200 millivolts.

b. A minimum polarization voltage shift of 100 millivolts as measured between the underground component and a saturated copper-copper

sulphate reference electrode contacting the earth directly over the underground component. This polarization voltage shift shall be determined by interrupting the protective current and measuring the polarization decay. When the protective current is interrupted, an immediate voltage shift will occur. The voltage reading, after the immediate shift, shall be used as the base reading from which to measure polarization decay. Measurements achieving 100 millivolts decay shall be made over 95 percent of the metallic surface being protected.

c. For any metallic component, a minimum of four (4) measurements shall be made using subparagraph (a), above, and achieving the "instant off" potential of minus 850 millivolts. Two (2) measurements shall be made over the anodes and two (2) measurements shall be made at different locations near the component and farthest away from the anode.

3.1.2 Aluminum

Aluminum underground component shall not be protected to a potential more negative than minus 1200 millivolts, measured between the underground component and a saturated copper-copper sulphate reference electrode contacting the earth, directly over the metallic component. Resistance, if required, shall be inserted in the anode circuit within the test station to reduce the potential of the aluminum to a value which will not exceed a potential more negative than minus 1200 millivolts. Voltage shift criterion shall be a minimum negative polarization shift of 100 millivolts measured between the metallic component and a saturated copper-copper sulphate reference electrode contacting the earth, directly over the metallic component. The polarization voltage shift shall be determined as outlined for iron and steel.

3.1.3 Copper Piping

For copper piping, the following criteria shall apply: A minimum of 100 millivolts of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte. The polarization voltage shift shall be determined as outlined for iron and steel.

3.2 ANODE STORAGE AND INSTALLATION

3.2.1 Anode Storage

Storage area for magnesium anodes will be designated by the Contracting Officer. If anodes are not stored in a building, tarps or similar protection should be used to protect anodes from inclement weather. Packaged anodes, damaged as a result of improper handling or being exposed to rain, shall be resacked by the Contractor and the required backfill added.

3.2.2 Anode Installation

Unless otherwise authorized, installation shall not proceed without the presence of the Contracting Officer. Anodes of the size specified shall be installed to the depth indicated[AM#1]_____. Locations may be changed to clear obstructions with the approval of the Contracting Officer. Anodes shall be installed in sufficient number and of the required type, size, and spacing to obtain a uniform current distribution over the surface of the structure. The anode system shall e designed for a life of 25 years of continuous operation. Anodes shall be installed as indicated in a dry condition after any plastic or waterproof protective covering has been completely removed from the water permeable, permanent container housing the anode metal. The anode connecting wire shall not be used for lowering the anode into the hole. The annular space around the anode shall be

backfilled with fine earth in 6 inch layers and each layer shall be hand tamped. Care must be exercised not to strike the anode or connecting wire with the tamper. Approximately 5 gallonsof water shall be applied to each filled hole after anode backfilling and tamping has been completed to a point about 6inches above the anode. After the water has been absorbed by the earth, backfilling shall be completed to the ground surface level.

3.2.2.1 Single Anodes

Single anodes, spaced as shown, shall be connected directly to the pipeline or connected through a test station to the pipeline as shown on the drawings, allowing adequate slack in the connecting wire to compensate for movement during backfill operation.

3.2.2.2 Welding Methods

Connections to ferrous pipe shall be made by exothermic weld methods manufactured for the type of pipe supplied. Electric arc welded connections and other types of welded connections to ferrous pipe and structures shall be approved before use.

3.2.3 Anode Placement - General

Packaged anodes shall be installed completely dry, and shall be lowered into holes by rope sling or by grasping the cloth gather. The anode lead wire shall not be used in lowering the anodes. The hole shall be backfilled with fine soil in 6inch layers and each layer shall be hand-tamped around the anode. Care must be exercised not to strike the anode or lead wire with the tamper. If immediate testing is to be performed, water shall be added only after backfilling and tamping has been completed to a point 6 inches above the anode. Approximately 2 gallons of water may be poured into the hole. After the water has been absorbed by the soil, backfilling and tamping may be completed to the top of the hole. Anodes shall be installed as specified or shown. In the event a rock strata is encountered prior to achieving specified augered-hole depth, anodes may be installed horizontally to a depth at least as deep as the bottom of the pipe, with the approval of the Contracting Officer.

3.2.4 Underground Pipeline

Anodes shall be installed at a minimum of 8 feet and a maximum of 10 feet from the line to be protected.

3.2.5 Installation Details

Details shall conform to the requirements of this specification. Details shown on the drawings are indicative of the general type of material required, and are not intended to restrict selection to material of any particular manufacturer.

3.2.6 Lead Wire Connections

3.2.6.1 Underground Pipeline (Metallic)

To facilitate periodic electrical measurements during the life of the sacrificial anode system and to reduce the output current of the anodes, if required, all anode lead wires shall be connected to a test station and buried a minimum of 24 inches in depth. The cable shall be No. 10 AWG, stranded copper, polyethylene or RHW-USE insulated cable. The cable shall make contact with the structure only through a test station. Resistance

wire shall be installed between the cable and the pipe cable, in the test station, to reduce the current output, if required. Anode connections, except in the test station, shall be made with exothermic welding process, and shall be insulated by means of at least three (3) layers of electrical tape; and all lead wire connections shall be installed in a moistureproof splice mold kit and filled with epoxy resin. Lead wire-to-structure connections shall be accomplished by an exothermic welding process. All welds shall be in accordance with the manufacturer's recommendations. A backfill shield filled with a pipeline mastic sealant or material compatible with the coating shall be placed over the weld connection and shall be of such diameter as to cover the exposed metal adequately.

3.2.6.2 Resistance Wire Splices

Resistance wire connections shall be accomplished with silver solder and the solder joints wrapped with a minimum of three (3) layers of pressure-sensitive tape. Lead wire connections shall be installed in a moistureproof splice mold kit and filled with epoxy resin.

3.2.7 Location of Test Stations

Test stations shall be of the type and location shown and shall be curb box mounted. Buried insulating joints shall be provided with test wire connections brought to a test station. Test stations shall be located as follows:

a. At 1,000-foot intervals or less.

b. Where the pipe or conduit crosses any other metal pipe.

c. At both ends of casings under roadways and railways.

d. Where both sides of an insulating joint are not accessible above ground for testing purposes.

3.2.8 Underground Pipe Joint Bonds

Underground pipe having other than welded or threaded coupling joints shall be made electrically continuous by means of a bonding connection installed across the joint.

3.3 ELECTRICAL ISOLATION OF STRUCTURES

3.3.1 Isolation Joints and Fittings

Isolating fittings, including main line isolating flanges and couplings, shall be installed aboveground, or within manholes, wherever possible. Where isolating joints must be covered with soil, they shall be fitted with a paper joint cover specifically manufactured for covering the particular joint, and the space within the cover filled with hot coal-tar enamel. Isolating fittings in lines entering buildings shall be located at least 12 inches above grade of floor level, when possible. Isolating joints shall be provided with grounding cells to protect against over-voltage surges or approved surge protection devices. The cells shall provide a low resistance across isolating joint without excessive loss of cathodic current.

3.3.2 Gas Distribution Piping

Electrical isolation shall be provided at each building riser pipe to the pressure regulator, at all points where a short to another structure or to a foreign structure may occur, and at other locations as indicated on the

drawings.

3.4 TRENCHING AND BACKFILLING

Trenching and backfilling shall be in accordance with Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS.

3.5 TESTS AND MEASUREMENTS

3.5.1 Baseline Potentials

Each test and measurement will be witnessed by the Contracting Officer. The Contractor shall notify the Contracting Officer a minimum of five (5) working days prior to each test. After backfill of the pipe, the static potential-to-soil of the pipe shall be measured. The locations of these measurements shall be identical to the locations specified for pipe-to-reference electrode potential measurements. The initial measurements shall be recorded.

3.5.2 Isolation Testing

Before the anode system is connected to the pipe, an isolation test shall be made at each isolating joint or fitting. This test shall demonstrate that no metallic contact, or short circuit exists between the two isolated sections of the pipe. Any isolating fittings installed and found to be defective shall be reported to the Contracting Officer.

3.5.2.1 Insulation Checker

A Model 601 insulation checker, as manufactured by "Gas Electronics", or an approved equal, using the continuity check circuit, shall be used for isolating joint (flange) electrical testing. Testing shall conform to the manufacturer's operating instructions. Test shall be witnessed by the Contracting Officer. An isolating joint that is good will read full scale on the meter. If an isolating joint is shorted, the meter pointer will be deflected or near zero on the meter scale. Location of the fault shall be determined from the instructions, and the joint shall be repaired. If an isolating joint is located inside a vault, the pipe shall be sleeved with insulator when entering and leaving the vault.

3.5.2.2 Cathodic Protection Meter

A Model B3A2 cathodic protection meter, as manufactured by "M.C. Miller", or an approved equal, using the continuity check circuit, shall be used for isolating joint (flange) electrical testing. This test shall be performed in addition to the Model 601 insulation checker. Continuity is checked across the isolation joint after the test lead wire is shorted together and the meter adjusted to scale. A full-scale deflection indicates the system is shorted at some location. The Model 601 verifies that the particular insulation under test is good and the Model B3A2 verifies that the system is isolated. If the system is shorted, further testing shall be performed to isolate the location of the short.

3.5.3 Anode Output

As the anodes are connected to the pipe , current output shall be measured with an approved clamp-on milliammeter, calibrated shunt with a suitable millivoltmeter or multimeter, or a low resistance ammeter. (Of the three methods, the low-resistance ammeter is the least desirable and most inaccurate. The clamp-on milliammeter is the most accurate.) The valves obtained and the date, time, and location shall be recorded.

3.5.4 Reference Electrode Potential Measurements

Upon completion of the installation and with the entire cathodic protection system in operation, electrode potential measurements shall be made using a copper-copper sulphate reference electrode and a potentiometer-voltmeter, or a direct-current voltmeter having an internal resistance (sensitivity) of not less than 10 megohms per volt and a full scale of 10 volts. The locations of these measurements shall be identical to the locations used for baseline potentials. The values obtained and the date, time, and locations of measurements shall be recorded. No less than eight (8) measurements shall be made over any length of line or component. Additional measurements shall be made at each distribution service riser, with the reference electrode placed directly over the service line.

3.5.5 Location of Measurements

3.5.5.1 Piping or Conduit

For coated piping or conduit, measurements shall be taken from the reference electrode located in contact with the earth, directly over the pipe. Connection to the pipe shall be made at service risers, valves, test leads, or by other means suitable for test purposes. Pipe-to-soil potential measurements shall be made at intervals not exceeding 10 feet. The Contractor may use a continuous pipe-to-soil potential profile in lieu of 5 foot interval pipe-to-soil potential measurements. Additional measurements shall be made at each distribution service riser, with the reference electrode placed directly over the service line adjacent to the riser. Potentials shall be plotted versus distance to an approved scale. Locations where potentials do not meet or exceed the criteria shall be identified and reported to the Contracting Officer's representative.

3.5.5.2 Casing Tests

Before final acceptance of the installation, the electrical separation of carrier pipe from casings shall be tested and any short circuits corrected.

3.5.5.3 Interference Testing

Before final acceptance of the installation, interference tests shall be made with respect to any foreign pipes in cooperation with the owner of the foreign pipes . A full report of the tests giving all details shall be made. Stray current measurements shall be performed at all isolating locations and at locations where the new pipeline crosses foreign metallic pipes. The method of measurements and locations of measurements shall be submitted for approval. As a minimum, stray current measurements shall be performed at the following locations:

a. Connection point of new pipeline to existing pipeline.

b. Crossing points of new pipeline with existing lines.

Results of stray current measurements shall also be submitted for approval.

3.5.5.4 Holiday Test

Any damage to the protective covering during transit and handling shall be repaired before installation. After field-coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current in accordance with NACE RP0188 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. Holidays in the protective covering shall be repaired upon

detection. Occasional checks of holiday detector potential will be made by the Contracting Officer to determine suitability of the detector. Labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor. The coating system shall be inspected for holes, voids, cracks, and other damage during installation.

3.5.5.5 Recording Measurements

All pipe-to-soil potential measurements, including initial potentials where required, shall be recorded. The Contractor shall locate, correct and report to the Contracting Officer any short circuits to foreign pipes encountered during checkout of the installed cathodic protection system. Pipe-to-soil potential measurements shall be taken on as many pipes as necessary to determine the extent of protection or to locate short-circuits.

3.6 CLEANUP

The Contractor shall be responsible for cleanup of the construction site. All paper bags, wire clippings, etc., shall be disposed of as directed. Paper bags, wire clippings and other waste shall not be put in bell holes or anodes excavation.

3.7 MISCELLANEOUS INSTALLATION AND TESTING

3.7.1 Excavation

In the event rock is encountered in providing the required depth for anodes, the Contractor shall determine an alternate approved location and, if the depth is still not provided, an alternate plan shall be submitted to the Contracting Officer. Alternate techniques and depths must be approved prior to implementation.

3.8 SPARE PARTS

After approval of shop drawings, and not later than three (3) months prior to the date of beneficial occupancy, the Contractor shall furnish spare parts data for each different item of material and equipment specified. The data shall include a complete list of parts, special tools, and supplies, with current unit prices and source of supply. In addition, the Contractor shall supply information for material and equipment replacement for all other components of the complete system, including anodes, cables, splice kits and connectors, corrosion test stations, and any other components not listed above.

3.9 SEEDING

Seeding shall be done by the Contractor, as directed, in all unsurfaced locations disturbed by this construction. In areas where grass cover exists, it is possible that sod can be carefully removed, watered, and stored during construction operations, and replaced after the operations are completed since it is estimated that no section of pipeline should remain uncovered for more than two (2) days. The use of sod in lieu of seeding shall require approval by the Contracting Officer.

3.10 SYSTEM TESTING

The Contractor shall submit a report including potential measurements taken at adequately-close intervals to establish that minus 850 millivolts potential, "instant-off" potential, is provided, and that the cathodic protection is not providing interference to other foreign pipes causing damage to paint or pipes. The report shall provide a narrative describing how the criteria of protection is achieved without damaging other pipe or

structures in the area.

-- End of Section --

SECTION 13280A

ASBESTOS ABATEMENT
11/01
AMENDMENT #0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z87.1	(1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z88.2	(1992) Respiratory Protection
ANSI Z9.2	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 732	(1995) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 1331	(1989; R 1995) Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D 2794	(1993) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	(1996) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM E 119	(1998) Fire Tests of Building Construction and Materials
ASTM E 1368	(1997) Visual Inspection of Asbestos Abatement Projects
ASTM E 736	(1992) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 84	(1998 el) Surface Burning Characteristics of Building Materials
ASTM E 96	(1995) Water Vapor Transmission of Materials

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(1990) Compressed Air for Human Respiration
CGA G-7.1	(1997) Commodity Specification for Air

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(1999; TIA 96-1, 96-2) Methods of Fire Tests for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90/018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
[AM#1]EPA 340/1-90/019	(1990) Asbestos/NESHAP Adequately Wet Guidance
EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 763	Asbestos
42 CFR 84	Approval of Respiratory Protective Devices
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586 (1996) High-Efficiency, Particulate, Air Filter Units

TEXAS DEPARTMENT OF HEALTH (TDH)

[AM#1]SECTIONS 295.31 THRU 295.7 Texas Asbestos Health Protection Rules

1.2 DEFINITIONS

a. Adequately Wet: A term defined in 40 CFR 61, Subpart M, and EPA 340/1-90-019 meaning to sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

b. Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact asbestos-containing material (ACM).

c. Amended Water: Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

d. Asbestos: Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophylite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

e. Asbestos-Containing Material (ACM): Any materials containing more than one percent asbestos.

f. Asbestos Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.

g. Authorized Person: Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

h. Building Inspector: Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

i. Certified Industrial Hygienist (CIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

j. Class I Asbestos Work: Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM. This activity is not applicable to this project.

k. Class II Asbestos Work: Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos - containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain "incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which

would fit into a glovebag may be classified as a Class III job.

l. Clean room: An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

m. Competent Person: In addition to the definition in 29 CFR 1926, Section .32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926, Section .1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

n. Contractor/Supervisor: Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

o. Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

p. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

q. Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

r. Disposal Bag: A 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926, Section .1101, used for transporting asbestos waste from containment to disposal site.

s. Disturbance: Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 60 inches in length and width in order to access a building component.

t. Equipment Room or Area: An area adjacent to the regulated area used for the decontamination of employees and their equipment.

u. Employee Exposure: That exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

v. Fiber: A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.

w. Friable ACM: A term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent, as determined by a method other than point

counting by PLM, the asbestos content is verified by point counting using PLM.

x. Glovebag: Not more than a 60 by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

y. High-Efficiency Particulate Air (HEPA) Filter: A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

z. Homogeneous Area: An area of surfacing material or thermal system insulation that is uniform in color and texture.

aa. Industrial Hygienist: A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

bb. Intact: ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphaltic, resinous, cementitious products does not render the ACM non-intact simply by being separated into smaller pieces.

cc. Model Accreditation Plan (MAP): USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763, Subpart E, Appendix C.

dd. Modification: A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system.

ee. Negative Exposure Assessment: A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

ff. NESHAP: National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

gg. Nonfriable ACM: A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material containing more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

hh. Nonfriable ACM (Category I): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

ii. Nonfriable ACM (Category II): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos, as determined using the methods specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

jj. Permissible Exposure Limits (PELs):

(1) PEL-Time weighted average(TWA): Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA), as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400.

(2) PEL-Excursion Limit: An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400.

kk. Regulated Area: An OSHA term defined in 29 CFR 1926, Section .1101 meaning an area established by the Contractor to demarcate areas where Class I, II.

ll. Removal: All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

mm. Repair: Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM attached to structures or substrates. If the amount of asbestos so "disturbed" cannot be contained in 1 standard glovebag or waste bag, Class I precautions are required.

nn. Spills/Emergency Cleanups: Cleanup of sizable amounts of asbestos waste and debris which has occurred, for example, when water damage occurs in a building, and sizable amounts of ACM are dislodged. A Competent Person evaluates the site and ACM to be handled, and based on the type, condition and extent of the dislodged material, classifies the cleanup as Class I or II.

oo. Surfacing ACM: Asbestos-containing material which contains more than 1% asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

pp. Thermal system insulation (TSI) ACM: ACM which contains more than 1% asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

qq. Transite: A generic name for asbestos cement wallboard and pipe.

rr. Worker: Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926, Section .1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.3 DESCRIPTION OF WORK

Work in this section for the project Fixed Wing Aircraft Park [AM#1] Phase II at Fort Hood, Texas includes asbestos-containing material (ACM) abatement [AM#1]as part of the Bid [AM#1]_____ [AM#1]in B/90050 Fire

Station and [AM#1]B/90049 Control Tower & Ops Bldg [AM#1]prior to demolition of the buildings, and demolishing non-friable ACM in-place with B/90079 Air Lift Terminal[AM#1], B/90080 Parachute Rigging Facility, and B/90071 Vehicle Scale as noted on Demolition Drawings and attached Asbestos Survey and Analysis Report.

B/90079 (10000 Square Feet) and B/90080 (Parachute Rigging Facility, 9000 Sq. Ft.) and 90071 (Concrete Pad Vehicle Weight Scale, 70 ft x 18 ft). Non-friable ACM floor tiles, tile mastic and roof penetration mastic are present in B/90079 but no ACM is present in B/90080 and 90071. No asbestos abatement is needed in B/90079 Air Lift Control Terminal. The non-friable ACM is in good condition and it shall be demolished in-place with B/90079, the total building demolition debris shall be disposed of at Fort Hood Landfill. The Contractor shall adequately wet the ACM debris. During demolition the ACM shall not be subjected to sanding, grinding, cutting, or abrading per EPA 340/1-90-018 and EPA 340/1-90-019.

Asbestos abatement involves OSHA Class I and Class II work shall be performed for Bid Options No. 1 and No. 2. Approximately asbestos quantities are identified on the project environmental drawings for the bid options. However, abatement of the ACM floor tiles, tile mastic and roof penetration mastic is not required in B/90050 (Bid Option No. 1). The non-friable ACM is in good condition and it shall be demolished in-place with B/90050, the total demolition debris shall be disposed of at the Fort Hood Landfill. The Contractor shall adequately wet the ACM debris. During demolition the ACM shall not be subjected to sanding, grinding, cutting, or abrading per EPA 340/1-90-018 and EPA 340/1-90-019.

The abated ACM debris shall be disposed off post.

Asbestos survey was performed in March 1999 (for B/90079, B/90080, and 90071), in November 1999 (for B/90050), and in January 2000 (for B/90049). A summary of work task data elements for each individual ACM abatement work task in is included in Table 1, "Individual Work Task Data Elements" at the end of this section. The Contractor shall verify abatement items and conditions prior to start work.

This section describes procedures and equipment required to protect workers and environment from airborne asbestos fibers, ACM dust and debris. This section asbestos abatement activity involves OSHA Class I and Class II work operation. The Contractor shall provide containment, storage, transportation and disposal of the generated ACM wastes. The Contractor shall provide specific operational procedures in the Accident Prevention Plan and its sub components, the Asbestos Hazard Abatement Plan and Activity Hazard Analyses required in paragraph, SAFETY AND HEALTH PROGRAM AND PLANS.

1.3.1 Abatement Work Tasks

A summary of work task data elements for each individual ACM abatement work task is in Table 1, "Individual Work Task Data Elements" at the end of this section.

1.3.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, the Contractor shall notify the Contracting Officer (CO) who will have the option of ordering up to six (6) bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM at no additional cost to

the Government. Any additional components identified as ACM that have been approved by the Contracting Officer for removal shall be removed by the Contractor and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling activities undertaken to determine the presence of additional ACM shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course required by 40 CFR 763, Subpart E, Appendix C.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Materials and Equipment; FIO.

Manufacturer's catalog data for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Material Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items:

a. High Efficiency Filtered Air (HEPA) local exhaust equipment

b. Vacuum cleaning equipment

c. Pressure differential monitor for HEPA local exhaust equipment

d. Air monitoring equipment

e. Respirators

f. Personal protective clothing and equipment

(1) Coveralls
(2) Underclothing
(3) Other work clothing
(4) Foot coverings
(5) Hard hats
(6) Eye protection
(7) Other items required and approved by Contractors Designated IH and Competent Person

g. Glovebag

h. Duct Tape

i. Disposal Containers

(1) Disposal bags
(2) Fiberboard drums
(3) Paperboard boxes

j. Sheet Plastic

(1) Polyethylene Sheet - General
(2) Polyethylene Sheet - Flame Resistant
(3) Polyethylene Sheet - Reinforced

k. Wetting Agent

(1) Amended Water
(2) Removal encapsulant

l. Strippable Coating

m. Prefabricated Decontamination Unit

n. Other items

o. Chemical encapsulant

p. Chemical encasement materials

q. Material Safety Data Sheets (for all chemicals proposed)

SD-04 Drawings

Site Layout; GA.

Descriptions, detail project drawings, and site layout for each building to include worksite containment area techniques, local exhaust ventilation system locations, decontamination units and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area. Site Layout shall be submitted with the Contractor's Asbestos Hazard Abatement Plan.

SD-08 Statements

Qualifications; GA.

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work.

Training Program; FIO.

A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees. The training document shall be signed by the Contractor's Designated Industrial Hygienist (IH) and Competent Person.

Medical Requirements; FIO.

Physician's written opinion.

Encapsulants; GA

Certificates stating that encapsulants meet the applicable specified performance requirements per paragraph ENCAPSULANTS.

SD-09 Reports

Exposure Assessment and Air Monitoring; GA

Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation per paragraph EXPOSURE ASSESSMENT AND AIR MONITORING.

Local Exhaust Ventilation; FIO.

Pressure differential recordings.

Licenses, Permits and Notifications; GA

Licenses, permits, and notifications submittal per paragraph LICENSES, PERMIT AND NOTIFICATIONS. In addition, prior to start work, Contractor shall submit current medical certificate, training certificate and state license of each worker, including air monitoring technician.

SD-13 Certificates

Vacuum, Filtration and Ventilation Equipment, FIO.

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.

SD-18 Records

Respiratory Protection Program; GA.

Records of the respirator program per paragraph RESPIRATORY PROTECTION PROGRAM.

Safety and Health Program and Plans; GA.

Preparation of Accident Prevention Plan, Asbestos Hazard Abatement Plan, and Activity Hazard Analyses per paragraph SAFETY AND HEALTH PROGRAM AND PLANS. Two copies of the Asbestos Hazard Abatement Plan shall be required. One copy shall be submitted to the Contracting Officer Representative (COR) and the other copy shall be submitted to Ms. Rosemarie Olney, Industrial Hygienist at Fort Hood DPW-ENV, 20 working days prior to the pre-construction meeting.

Cleanup and Disposal; GA.

A copy of waste shipment records, weigh bills, delivery tickets, daily narrative log of work, descriptions of problems and resolutions, exposure assessment and analytical results shall be provided with the Closure Report. The Closure Report shall be furnished to the COR in at least 10 working days after completion of work in this section, and prior to final payment.

1.5 QUALIFICATIONS

1.5.1 Written Qualifications and Organization Report

The Contractor shall furnish a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; Designated IH (person assigned to project and firm name); independent testing laboratory (including name of firm, principal, and analysts who will perform analyses); all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. The report shall include an organization chart showing the Contractor's staff organization for this project by name and title, chain of command and reporting relationship with all subcontractors. The report shall be signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. The Contractor shall include the following statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and the federal, state and local requirements specified in paragraph SAFETY AND HEALTH PROGRAM AND PLANS for those asbestos abatement activities that they will be involved in."

1.5.2 Specific Requirements

The Contractor shall designate in writing, personnel meeting the following qualifications:

a. Designated Competent Person: The name, address, telephone number, and resume of the Contractor's Designated Competent Person shall be provided. Evidence that the full-time Designated Competent Person is qualified in accordance with 29 CFR 1926, Sections .32 and .1101, has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and is experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, notification of other employees onsite, etc. The duties of the Competent Person shall include the following: controlling entry to and exit from the regulated area; supervising any employee exposure monitoring required by 29 CFR 1926, Section .1101; ensuring that all employees working within a regulated area wear the appropriate personal protective equipment (PPE), are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified; and ensuring that engineering controls in use are in proper operating conditions and are functioning properly. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan and Asbestos Hazard Abatement Plan. The Designated Competent Person shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence

that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

b. Project Supervisors: The Contractor shall provide the name, address, telephone number, and resume of the Project Supervisor who have responsibility to implement the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, the authority to direct work performed under this contract and verify compliance, and have EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Project Supervisor shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities.

c. Designated Industrial Hygienist (IH) and Industrial Hygiene Technician (IHT):

The Contractor shall provide the name, address, telephone number, resume, and other information specified below for the IHT selected to prepare the Contractor's Asbestos Hazard Abatement Plan, prepare and perform any training, direct air monitoring and assist the Contractor's Competent Person in ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board certified in the practice of industrial hygiene as determined and documented by the American Board of Industrial Hygiene (ABIH), have a minimum of 2 years of comprehensive experience in planning and overseeing asbestos abatement activities and have EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training required by 40 CFR 763 Subpart E, Appendix C. The Designtaed IH shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Designated IH shall be completely independent from the Contractor according to federal, state, or local regulations; that is, shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's current valid ABIH certification shall be included. The Designated IH shall be on-site when requested by the IHT and shall be available for emergencies. The Contractor shall submit, the name, address, telephone numbers and resumes IHT who will be under the guidance of the Designated CIH and performing on-site tasks. IHT supporting the Designated IH shall have a minimum of 2 years of practical on-site asbestos abatement experience, and have a current air monitoring technician license per Texas Asbestos Health Protection Rules, Section 295.52, with the Texas Department of Health. The formal reporting relationship between the Designated IH, the IHT, the Designated Competent Person, and the Contractor shall be indicated in the Contractor's Asbestos Hazard Abatement Plan.

d. Asbestos Abatement Workers: Asbestos abatement workers shall meet

the requirements contained in 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment" in this paragraph.

e. Worker Training and Certification of Worker Acknowledgment: Training documentation will be required for each employee who will perform OSHA Class I, Class II, Class III, or Class IV asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

f. Physician: The Contractor shall provide the name, medical qualifications, address, telephone number and resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926, Section .1101 and paragraph MEDICAL REQUIREMENTS. The physician shall be familiar with the site's hazards and the scope of this project.

g. First Aid and CPR Trained Persons: The names of at least 2 persons who are currently trained in first aid and CPR by the American Red Cross or other approved agency shall be designated and shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030 and shall be included in the Contractor's Bloodborne Pathogen Program. These persons may perform other duties but shall be immediately available to render first aid when needed. A copy of each designated person's current valid First Aid and CPR certificate shall be provided.

h. Independent Testing Laboratory: The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

(1) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, the most current version of NIOSH Pub No. 84-100 Method 7400, and NIOSH Pub No. 84-100 Method 7402, transmission electron microscopy (TEM); the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program; the names of the selected microscopists who will analyze airborne samples by

PCM with verified documentation of their proficiency to conduct PCM analyses by being judged proficient in counting samples as current participating analysts in the AIHA PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent) with a copy of course completion certificate provided; when the PCM analysis is to be conducted onsite, documentation shall be provided certifying that the onsite analyst meets the same requirements.

(2) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts (names shall be provided) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

(3) Transmission electron microscopy (TEM): The laboratory is fully equipped and proficient in conducting TEM analysis of airborne samples using the mandatory method specified by 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for airborne sample analysis of asbestos by TEM; the laboratory will use analysts (names shall be provided) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM. The laboratory is proficient in conducting analysis for low asbestos concentration, enhanced analysis of floor tiles and bulk materials where multiple layers are present, using an improved EPA test method titled, "Method for the Determination of Asbestos in Bulk Building Materials".

(4) PCM/TEM: The laboratory is fully equipped and each analyst (name shall be provided) possesses demonstrated proficiency in conducting PCM and TEM analysis of airborne samples using NIOSH Pub No. 84-100Method 7400 PCM and NIOSH Pub No. 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

i. Disposal Facility, Transporter: The Contractor shall provide written evidence that the landfill to be used is approved for asbestos disposal by the state and local regulatory agencies. Copies of signed agreements between the Contractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste generated during the performance of this contract shall be provided. Qualifications shall be provided for each subcontractor or transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61, Section .150(b), and other applicable state or local requirements.

1.5.3 Federal, State or Local Citations on Previous Projects

The Contractor and all subcontractors shall submit a statement, signed by an officer of the company, containing a record of any citations issued by Federal, State or local regulatory agencies relating to asbestos activities

(including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations). If there are none, a negative declaration signed by an officer of the company shall be provided.

1.6 REGULATORY REQUIREMENTS

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. This includes, but is not limited to, OSHA standards, 29 CFR 1926, especially Section .1101, 40 CFR 61, Subpart M and 40 CFR 763. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. The following state and local laws, rules and regulations regarding demolition, removal, encapsulation, construction alteration, repair, maintenance, renovation, spill/emergency cleanup, housekeeping, handling, storing, transporting and disposing of asbestos material apply: Texas Asbestos Health Protection Rules.

1.7 SAFETY AND HEALTH PROGRAM AND PLANS

The Contractor shall develop and submit a written comprehensive site-specific Accident Prevention Plan at least 30 days prior to the preconstruction conference. The Accident Prevention Plan shall address requirements of EM 385-1-1, Appendix A, covering onsite work to be performed by the Contractor and subcontractors. The Accident Prevention Plan shall incorporate an Asbestos Hazard Abatement Plan, and Activity Hazard Analyses as separate appendices into 1 site specific Accident Prevention Plan document. Any portions of the Contractor's overall Safety and Health Program that are referenced in the Accident Prevention Plan, e.g., respirator program, hazard communication program, confined space entry program, etc., shall be included as appendices to the Accident Prevention Plan. The plan shall take into consideration all the individual asbestos abatement work tasks identified in Table 1. The plan shall be prepared, signed (and sealed, including certification number if required), and dated by the Contractor's Designated IH, Competent Person, and Project Supervisor.

1.7.1 Asbestos Hazard Abatement Plan Appendix

The Asbestos Hazard Abatement Plan appendix to the Accident Prevention Plan shall include, but not be limited to, the following:

a. The personal protective equipment to be used;

b. The location and description of regulated areas including clean and dirty areas,access tunnels, and decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit);

c. Initial exposure assessment in accordance with 29 CFR 1926, Section .1101;

d. Level of supervision;

e. Method of notification of other employers at the worksite;

f. Abatement method to include containment and control procedures;

g. Interface of trades involved in the construction;

h. Sequencing of asbestos related work;

i. Storage and disposal procedures and plan;

j. Type of wetting agent and asbestos encapsulant to be used;

k. Location of local exhaust equipment;

l. Air monitoring methods (i.e. personal, environmental and clearance);

m. Bulk sampling and analytical methods (if required and as approved by the Contracting Officer);

n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations (if possible, remove employees in adjacent work areas during asbestos abatement);

o. Fire and medical emergency response procedures;

p. The security procedures to be used for all regulated areas.

q. The type of hygiene facility to be used.

r. Surfaces that required precleaning.

1.7.2 Activity Hazard Analyses Appendix

Activity Hazard Analyses, for each major phase of work, shall be submitted and updated during the project. The Activity Hazard Analyses format shall be in accordance with EM 385-1-1 (Figure 1-1). The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the Activity Hazard Analyses has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The Activity Hazard Analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.8 PRECONSTRUCTION CONFERENCE AND ONSITE SAFETY

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, and Designated CIH shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's submitted Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses appendices. Deficiencies in the Accident Prevention Plan will be discussed and the Accident Prevention Plan shall be revised to correct the deficiencies and resubmitted for acceptance. Any changes required in the specification as a result of the Accident Prevention Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer, prior to the start of work. Onsite work shall not begin until the Accident Prevention Plan has been accepted.

A copy of the written Accident Prevention Plan shall be maintained onsite. Changes and modifications to the accepted Accident Prevention Plan shall be made with the knowledge and concurrence of the Designated CIH, the Project Supervisor, Designated Competent Person, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Designated CIH shall bring such hazard to the attention of the Project Supervisor, Designated Competent Person, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Once accepted by the Contracting Officer, the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses will be enforced as if an addition to the contract. Disregarding the provisions of this contract or the accepted Accident Prevention Plan will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

1.9 SECURITY

Fenced and locked security areashall be provided for each regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel authorized by the Contractor and the Contracting Officer. Personnel authorized to enter regulated areas shall be trained, be medically evaluated, and wear the required personal protective equipment for the specific regulated area to be entered.

1.10 MEDICAL REQUIREMENTS

Medical requirements shall conform to 29 CFR 1926, Section .1101.

1.10.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101 and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.10.1.1 Information Provided to the Physician

The Contractor shall provide the following information in writing to the examining physician:

a. A copy of 29 CFR 1926, Section .1101 and Appendices D, E, G, and I;

b. A description of the affected employee's duties as they relate to the employee's exposure; a copy of 29 CFR 1910, Section .134 and Appendix D;

c. The employee's representative exposure level or anticipated exposure level;

d. A description of any personal protective and respiratory equipment used or to be used; and all supplemental information in compliance with 29 CFR 1910, Section .134 (e);

e. Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.10.1.2 Written Medical Opinion

For each worker, a written medical opinion prepared and signed by a licensed physician indicating the following:

a. Summary of the results of the examination.

b. The potential for an existing physiological condition that would place the employee at an increased risk of health impairment from exposure to asbestos.

c. The ability of the individual to wear personal protective equipment, including respirators, while performing strenuous work tasks under cold and/or heat stress conditions.

d. A statement that the employee has been informed of the results of the examination, provided with a copy of the results, informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure, and informed of any medical condition that may result from asbestos exposure.

1.10.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records, and exposure data, as required by 29 CFR 1910, Section .1910.20 and 29 CFR 1926, Section .1101 for a period of 30 years after termination of employment. Records of the required medical examinations and exposure data shall be made available, for inspection and copying, to the Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. A copy of the required medical certification for each employee shall be maintained on file at the worksite for review, as requested by the Contracting Officer or the representatives.

1.11 TRAINING PROGRAM

1.11.1 General Training Requirements

The Contractor shall establish a training program as specified by EPA Model Accreditation Plan (MAP), training requirements at 40 CFR 763, Subpart E, Appendix C, the State of Texas Sections 295.64 and 295.65, OSHA requirements at 29 CFR 1926, Section .1101(k)(9), and this specification. Contractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the Contracting Officer as specified in paragraph QUALIFICATIONS.

1.11.2 Project Specific Training

Prior to commencement of work, each worker shall be instructed by the Contractor's Designated IH and Competent Person in the following project specific training:

a. The hazards and health effects of the specific types of ACM to be abated;

b. The content and requirements of the Contractor's Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and

Activity Hazard Analyses and site-specific safety and health precautions;

c. Hazard Communication Program;

d. Hands-on training for each asbestos abatement technique to be employed;

e. Heat and/or cold stress monitoring specific to this project;

f. Air monitoring program and procedures;

g. Medical surveillance to include medical and exposure record-keeping procedures;

h. The association of cigarette smoke and asbestos-related disease;

i. Security procedures;

j. Specific work practice controls and engineering controls required for each Class of work in accordance with 29 CFR 1926, Section .1101.

1.12 RESPIRATORY PROTECTION PROGRAM

The Contractor's Designated CIH shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926, Section .1101, 29 CFR 1910, Section .134, ANSI Z88.2, CGA G-7, CGA G-7.1. The Contractor 's Designated IH shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.

b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.

c. Medical evaluation by a physician or other licensed health care professionals, with the Mandatory Evaluation Questionnaire in 29 CFR 1910, Section .132, Appendix C for the employee's fit testing or workers who are required to use respirator (e)(1)..

d. Training in the proper use and limitations of respirators.

e. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.

f. Regular cleaning and disinfection of respirators.

g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.

h. Storage of respirators in convenient, clean, and sanitary locations.

i. Surveillance of regulated area conditions and degree of employee exposure (e.g., through air monitoring).

j. Regular evaluation of the continued effectiveness of the respiratory protection program.

k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; contact lenses usage; etc.).

l. Proper training in putting on and removing respirators.

1.12.1 Respiratory Fit Testing

A qualitative or quantitative fit test conforming to 29 CFR 1926, Section 1101, Appendix C shall be conducted by the Contractor's Designated CIH for each Contractor worker required to wear a respirator, and for the Contracting Officer and authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed for each worker wearing a negative-pressure respirator prior to initially wearing a respirator on this project and every 6 months thereafter. The qualitative fit tests may be used only for testing the fit of negative pressure air-purifying respirator that must achieve a fit factor of 100 or less. If physical changes develop that will affect the fit, a new fit test for the worker shall be performed. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.12.2 Respirator Selection and Use Requirements

The Contractor shall provide respirators, and ensure that they are used as required by 29 CFR 1926, Section .1101, and 29 CFR 1910 Section .134 and in accordance with the manufacturer's recommendations. Respirators shall be jointly approved by the National Institute for Occupational Safety and Health (NIOSH), under the provisions of 42 CFR 84, N100, R100, P100 particulate filters for use in environments containing airborne asbestos fibers. Personnel who handle ACM, enter regulated areas that require the wearing of a respirator, or who are otherwise carrying out abatement activities that require the wearing of a respirator, shall be provided with approved respirators that are fully protective of the worker at the measured or anticipated airborne asbestos concentration level to be encountered. For air-purifying respirators, the particulate filter portion of the cartridges or canister approved for use in airborne asbestos environments shall be N100, R100, P100 particulate filters per 42 CFR 84. The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor's IHT with documented approval of Designated CIH, based on the measured or anticipated airborne asbestos fiber concentrations to be encountered (as recorded by the IHT). Recommendations made by the Contractor's IHT to downgrade respirator type, with the written approval of the Designated CIH, shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person, IHT, in consultation with the Designated CIH, shall have the authority to take immediate action to upgrade or downgrade respiratory type when there is an immediate danger to the health and safety of the wearer. Respirators shall be used in the following circumstances:

a. During all Class I asbestos jobs.

b. During all Class II work where the ACM is not removed in a substantially intact state.

c. During all Class II work which is not performed using wet methods. Respirators need not be worn during removal of ACM from sloped

roofs when a negative exposure assessment has been made and ACM is removed in an intact state.

d. During all Class II asbestos jobs where the Contractor does not produce a negative exposure assessment.

e. During all work where employees are exposed above the PEL-TWA or PEL-Excursion Limit.

f. In emergencies

1.12.3 Class I Work

For Class I work, the Contractor shall provide: (1) a tight-fitting, powered air purifying respirator equipped with N100, R100 or P100, or (2) a full-facepiece supplied air respirator operated in the pressure demand mode, equipped with HEPA egress cartridges, or (3) an auxiliary positive pressure self-contained breathing apparatus, for all employees within the regulated area where Class I work is being performed; provided that a negative exposure assessment has not been produced, and that the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full-facepiece supplied air respirator, operated in the pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions, if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

1.12.4 Class II Work

The Contractor shall provide an air purifying respirator, other than a disposable respirator, equipped with high-efficiency filters whenever the employee performs Class II asbestos jobs where the Contractor does not produce a negative exposure assessment.

1.12.5 Sanitation

Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

1.13 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section .59. Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Contracting Officer and 1 copy shall be included in the Contractor's Hazard Communication Program.

1.14 LICENSES, PERMITS AND NOTIFICATIONS

1.14.1 General Legal Requirements

Necessary licenses, permits and notifications shall be obtained in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. The Contractor shall notify the Texas Department of Health, Asbestos Program Branch, Austin, Texas, in writing, at least 20 working days prior to the commencement of work, including the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notification shall be by Certified Mail, Return Receipt Requested. Notification shall be signed by a representative of DPW-Environmental who

has signature authority. The Contractor shall furnish copies of the receipts to the Contracting Officer, prior to the commencement of work. Local fire department shall be notified 3 days before fire-proofing material is removed from a building and the notice shall specify whether or not the material contains asbestos. A copy of the rental company's written acknowledgment and agreement shall be provided as required by paragraph RENTAL EQUIPMENT. For licenses, permits, and notifications that the Contractor is responsible for obtaining, the Contractor shall pay any associated fees or other costs incurred.

1.14.2 Litigation and Notification

The Contractor shall notify the Contracting Officer if any of the following occur:

a. The Contractor or any of the subcontractors are served with notice of violation of any law, regulation, permit or license which relates to this contract;

b. Proceedings are commenced which could lead to revocation of related permits or licenses; permits, licenses or other Government authorizations relating to this contract are revoked;

c. Litigation is commenced which would affect this contract;

d. The Contractor or any of the subcontractors become aware that their equipment or facilities are not in compliance or may fail to comply in the future with applicable laws or regulations.

1.15 PERSONAL PROTECTIVE EQUIPMENT

One (1) complete set of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the regulated area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment and the Contractor shall ensure that it is worn properly. The Contractor's Designated IH and Designated Competent Person shall select and approve all the required personal protective clothing and equipment to be used.

1.15.1 Respirators

Respirators shall be in accordance with paragraph RESPIRATORY PROTECTION PROGRAM.

1.15.2 Whole Body Protection

Personnel exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. The Contractor's Designated IH and Competent Person shall select and approve the whole body protection to be used. The Competent Person shall examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work. When rips or tears are detected while an employee is working, rips and tears shall be immediately mended, or the work suit shall be immediately replaced. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated

area or be properly laundered in accordance with 29 CFR 1926, Section .1101. Whole body protection used for asbestos abatement shall not be removed from the worksite by a worker to be cleaned. Recommendations made by the Contractor's IHT (with written approval of Designated IH) to downgrade whole body protection shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person, IHT, in consultation with the Designated IH, has the authority to take immediate action to upgrade or downgrade whole body protection when there is an immediate danger to the health and safety of the wearer.

1.15.2.1 Coveralls

Disposable-breathable coveralls with a zipper front shall be provided as the approved Contractor's Asbestos Hazard Abatement Plan. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles. See DETAIL SHEET 13.

1.15.2.2 Underwear

Disposable underwear shall be provided. If reusable underwear are used, they shall be disposed of as asbestos contaminated waste or laundered in accordance with 29 CFR 1926, Section .1101. Asbestos abatement workers shall not remove contaminated reusable underwear worn during abatement of ACM from the site to be laundered.

1.15.2.3 Work Clothing

An additional coverall shall be provided when the abatement and control method employed does not provide for the exit from the regulated area directly into an attached decontamination unit. Cloth work clothes for wear under the protective coverall, and foot coverings, shall be provided when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated waste or properly laundered in accordance with 29 CFR 1926, Section .1101.

1.15.2.4 Gloves

Gloves shall be provided to protect the hands. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable glove shall be provided and used.

1.15.2.5 Foot Coverings

Cloth socks shall be provided and worn next to the skin. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Rubber boots shall be used in moist or wet areas. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste. Disposable protective foot covering shall be disposed of as ACM waste. If rubber boots are not used, disposable foot covering shall be provided.

1.15.2.6 Head Covering

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the regulated area after being thoroughly decontaminated.

1.15.2.7 Protective Eye Wear

Eye protection provided shall be in accordance with ANSI Z87.1.

1.16 HYGIENE FACILITIES AND PRACTICES

The Contractor shall establish a decontamination area for the decontamination of employees, material and equipment. The Contractor shall ensure that employees enter and exit the regulated area through the decontamination area.

1.16.1 Shower Facilities

Shower facilities, when provided, shall comply with 29 CFR 1910, Section .141(d)(3).

1.16.2 3-Stage Decontamination Area

A temporary negative pressure decontamination unit that is adjacent and attached in a leak-tight manner to the regulated area shall be provided as described in the approved Contractor's Asbestos Hazard Abatement Plan. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The decontamination unit shall have an equipment room and a clean room separated by a shower that complies with 29 CFR 1910, Section .141 (unless the Contractor can demonstrate that such facilities are not feasible). Equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste. Two separate lockers shall be provided for each asbestos worker, one in the equipment room and one in the clean room. Hot water service may be secured from the building hot water system provided backflow protection is installed by the Contractor at the point of connection. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40 gal. electric water heater with minimum recovery rate of 20 gal. per hour and a temperature controller for each showerhead. The Contractor shall provide a minimum of 2 showers. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater, upon approval by the Contracting Officer. Flow and temperature controls shall be located within the shower and shall be adjustable by the user. The wastewater pump shall be sized for 1.25 times the showerhead flow-rate at a pressure head sufficient to satisfy the filter head loss and discharge line losses. The pump shall supply a minimum 25 gpm flow with 35 ft. of pressure head. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material. Filtered water shall be discharged to the sanitary system. Wastewater filters shall be installed in series with the first stage pore size of 20 microns and the second stage pore size of 5 microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926, Section .1101.

1.16.3 Load-Out Unit

A temporary load-out unit that is adjacent and connected to the regulated area shall be provided as described in the Contractor's Asbestos Hazard Abatement Plan. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The load-out unit shall be attached in a leak-tight manner to each regulated area. Surfaces of the load-out unit shall be adequately wet-wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated

waste.

1.16.4 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 25 feet or 10 square feet of TSI or surfacing ACM, and for Class II and Class III asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment produced before the operation. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which is contaminated with asbestos. The equipment room or area shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.5 Decontamination Area Entry Procedures

The Contractor shall ensure that employees entering the decontamination area through the clean room or clean area:

a. Remove street clothing in the clean room or clean area and deposit it in lockers.

b. Put on protective clothing and respiratory protection before leaving the clean room or clean area.

c. Pass through the equipment room to enter the regulated area.

1.16.6 Decontamination Area Exit Procedures

The Contractor shall ensure that the following procedures are followed:

a. Before leaving the regulated area, respirators shall be worn while employees remove all gross contamination and debris from their work clothing using a HEPA vacuum.

b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers (see Detail Sheets 9 and 14) for disposal and/or laundering.

c. Employees shall not remove their respirators in the equipment room.

d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, the Contractor shall ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

e. After showering, employees shall enter the clean room before changing into street clothes.

1.16.7 Lunch Areas

The Contractor shall provide lunch areas in which the airborne concentrations of asbestos are below 0.01 f/cc.

1.16.8 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the Contracting Officer.

1.17 REGULATED AREAS

All Class I and IIasbestos work shall be conducted within regulated areas. The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they shall demarcate the regulated area. Access to regulated areas shall be limited to authorized persons. The Contractor shall control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.18 WARNING SIGNS AND TAPE

Warning signs and tape printed bilingually, in English and Spanish shall be provided at the regulated boundaries and entrances to regulated areas. The Contractor shall ensure that all personnel working in areas contiguous to regulated areas comprehend the warning signs. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs shall be in vertical format conforming to 29 CFR 1910 and 29 CFR 1926, Section .1101, a minimum of 20 by 14 inches, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

PELIGRO
ASBESTOS
PRECAUCION ENFERMEDADES DEL CANCER Y PULMON
SOLAMENTE AUTORIZADO PERSONAL

Spacing between lines shall be at least equal to the height of the upper of any two lines. Warning tape shall be provided. Decontamination unit signage shall be posted.

1.19 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable. Warning labels shall conform to 29 CFR 1926, Section .1101 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

PELIGRO

CONTIENE FIBRAS DE ASBESTOS
EVITE LA CREACION DE POLVO
PRECAUCION ENFERMEDADES DEL CANCER Y PULMON

1.20 LOCAL EXHAUST VENTILATION

Local exhaust ventilation units shall conform to ANSI Z9.2 and 29 CFR 1926, Section .1101. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled.

1.21 TOOLS

Vacuums shall be leak proof to the filter, equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system, or has otherwise been approved for use by the Contracting Officer. Residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

1.22 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.23 AIR MONITORING EQUIPMENT

The Contractor's Designated CIH shall approve air monitoring equipment to be used to collect samples. The equipment shall include, but shall not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute when equipped with a sampling train of tubing and filter cassette.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands, to be used with low flow pumps in accordance with 29 CFR 1926, Section .1101 for personal air sampling.

d. Single use standard 25 mm diameter cassette, open face, 0.45 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH Pub No. 84-100 Methods

7400 and 7402.

e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette.

f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

1.24 EXPENDABLE SUPPLIES

1.24.1 Glovebag

Glovebags shall be provided as described in 29 CFR 1926, Section .1101. The glovebag assembly shall be 6 mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

1.24.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container shall be provided.

1.24.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926 Section .1101.

1.24.4 Disposal Bags

Leak-tight bags, 6 mil thick, shall be provided for placement of asbestos generated waste.

1.24.5 Sheet Plastic

Sheet plastic shall be polyethylene of 6 mil minimum thickness and shall be provided in the largest sheet size necessary to minimize seams, as indicated on the Contractor's Asbestos Hazard Abatement Plan. Film shall be frosted and conform to ASTM D 4397, except as specified below:

1.24.5.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall be frosted and shall conform to the requirements of NFPA 701.

1.24.5.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.24.6 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.24.7 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents

used onsite shall have a flash point greater than 140 degrees F.

1.24.8 Leak-tight Wrapping

Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

1.24.9 Viewing Inspection Window

Where feasible, a minimum of 1 clear, 1/8 inch thick, acrylic sheet, 18 by 24 inches, shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure as indicated in the approved Contractor's Asbestos Hazard Abatement Plan. The windows shall be sealed leak-tight with industrial grade duct tape.

1.24.10 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

1.24.11 Strippable Coating

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping, at the completion of work. This work shall only be done in well ventilated areas.

1.25 MISCELLANEOUS ITEMS

A sufficient quantity of other items, such as, but not limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of containments, UL approved temporary electrical equipment, material and cords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc., shall be provided.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity	Univ. of Pittsburgh Protocol

ALL ENCAPSULANTS

Requirement	Test Standard
Zero Mortality	
Life Expectancy, 20 yrs	ASTM C 732
Accelerated Aging Test	
Permeability, Minimum	ASTM E 96
0.4 perms	

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test,	ASTM E 736
50 pounds of force/foot	
Fire Resistance, Negligible	ASTM E 119
affect on fire resistance	
rating over 3 hour test (Classified	
by UL for use over fibrous and	
cementitious sprayed fireproofing)	
Impact Resistance, Minimum	ASTM D 2794
43 in-lb (Gardner Impact Test)	
Flexibility, no rupture or	ASTM D 522
cracking (Mandrel Bend Test)	

Additional Requirements for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test,	ASTM E 736
50 pounds of force/foot	
Fire Resistance, Negligible	ASTM E 119
affect on fire resistance	
rating over 3 hour test(Classified	
by UL for use over fibrous and	
cementitious sprayed fireproofing)	
Impact Resistance, Minimum	ASTM D 2794
43 in-lb (Gardner Impact Test)	
Flexibility, no rupture or	ASTM D 522
cracking (Mandrel Bend Test)	

Additional Requirements for Lockdown Encapsulant

Requirement	Test Standard
Fire Resistance, Negligible	ASTM E 119
affect on fire resistance	
rating over 3 hour test(Tested	
with fireproofing over encapsulant	
applied directly to steel member)	
Bond Strength, 100 pounds of	ASTM E 736
force/foot (Tests	
compatibility with cementitious	
and fibrous fireproofing)	

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Asbestos abatement work tasks shall be performed as summarized in paragraph DESCRIPTION OF WORK ((including Table 1) and the Contractor's Accident

Prevention Plan, Asbestos Hazard Abatement Plan, and the Activity Hazard Analyses. The Contractor shall use the engineering controls and work practices required in 29 CFR 1926, Section .1101(g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment as in the approved Contractor's Asbestos Hazard Abatement Plan. The Contractor shall not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. All hot work (burning, cutting, welding, etc.) shall be conducted under controlled conditions in conformance with 29 CFR 1926, Section .352, Fire Prevention. Personnel of other trades, not engaged in asbestos abatement activities, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's Accident Prevention Plan are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal. The Contractor shall stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air sampling. Work shall resume only upon notification by the Contracting Officer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement shall be performed without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government, as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's IHT, in consultation with the Designated CIH as needed, and the COR, work shall proceed.

3.3 OBJECTS

3.3.1 Removal of Mobile Objects

Mobile objects, furniture, and equipment will be removed from the area of work by the Government before asbestos abatement work begins. The Contractor shall coordinate such work with the COR.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Building ventilating systems supplying air into or returning air out of a regulated area shall be shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1910, Section .147 and isolated by airtight seals to prevent the spread of contamination throughout the system. Air-tight critical barriers shall be installed on building ventilating openings located inside the regulated area that supply or return air from the building ventilation system or serve to exhaust air from the building. The critical barriers shall consist of 2 layers of polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape.

3.5 PRECLEANING

The Contractor shall identify surfaces to be precleaned in the Contractor's Asbestos Hazard Abatement Plan. Surfaces shall be cleaned by HEPA vacuum and adequately wet wiped prior to establishment of containment.

3.6 METHODS OF COMPLIANCE

3.6.1 Mandated Practices

The Contractor shall employ proper handling procedures in accordance with 29 CFR 1926 and 40 CFR 61, Subpart M, and the specified requirements. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Abatement Plan including, but not limited to, details of construction materials, equipment, and handling procedures. The Contractor shall use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters to collect debris and dust containing ACM.

b. Wet methods or wetting agents to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup; except where it can be demonstrated that the use of wet methods is unfeasible due to, for example, the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposal in leak-tight containers of wastes and debris contaminated with asbestos.

d. Inspection and repair of polyethylene in work and high traffic areas.

e. Cleaning of equipment and surfaces of containers filled with ACM prior to removing them from the equipment room or area.

3.6.2 Control Methods

The Contractor shall use the following control methods to comply with the PELs:

a. Local exhaust ventilation equipped with HEPA filter dust collection systems;

b. Enclosure or isolation of processes producing asbestos dust;

c. Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;

d. Use of other work practices and engineering controls;

e. Where the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the PELs, the Contractor shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with paragraph, RESPIRATORY PROTECTION PROGRAM.

3.6.3 Unacceptable Practices

The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

c. Dry sweeping, shoveling, or other dry clean-up of dust and debris containing ACM.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.6.4 Class I Work Procedures

For Class I asbestos work, the following engineering controls and work practices shall be used, in addition to requirements of paragraphs Mandated Practices and Control Methods:

a. A Competent Person shall supervise the installation and operation of the control system.

b. For jobs involving the removal of more than 25 feet or 10 square feet of TSI or surfacing material, the Contractor shall place critical barriers over all openings to the regulated area.

c. HVAC systems shall be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.

d. Impermeable dropcloths (6 mil or greater thickness) shall be placed on surfaces beneath all removal activity.

e. Objects within the regulated area shall be handled as specified in paragraph OBJECTS.

f. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated to move contaminated air away from the employee's breathing zone toward a HEPA unit or collection device.

3.6.5 Specific Control Methods for Class I Work

In addition to requirements of paragraph Class I Work Procedures, Class I asbestos work shall be performed using the control methods identified in the subparagraphs below.

3.6.5.1 Negative Pressure Enclosure (NPE) System

The NPE system shall provide at least 4 air changes per hour inside the containment. The local exhaust unit equipment shall be operated 24 hours per day until the containment is removed, and shall be leak-proof to the filter and equipped with HEPA filters. Air movement shall be directed away from the employees and toward a HEPA filtration device. The NPE shall be smoke tested for leaks at the beginning of each shift. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential

of minus 0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic manometric recording instrument. Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's Designated Competent Person and IH prior to submittal. The Contracting Officer shall be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system shall not be used as the local exhaust system for the regulated area. The local exhaust system shall terminate outdoors unless an alternate arrangement is allowed by the Contract Officer. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.6.5.2 Glovebag Systems

The glovebag system shall be used to remove ACM from straight runs of piping and elbows and other connections. Glovebags shall be used without modification and shall be smoke-tested for leaks and any leaks sealed prior to use. Glovebags shall be installed to completely cover the circumference of pipe or other structures where the work is to be done. Glovebags shall be used only once and shall not be moved. Glovebags shall not be used on surfaces that have temperatures exceeding 150 degrees F. Prior to disposal, glovebags shall be collapsed by removing air within them using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least 2 persons shall perform Class I glovebag removal. Asbestos regulated work areas shall be established as specified and shown on detailed drawings and plans for glovebag abatement. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape.

a. In addition to requirements for negative pressure glovebag systems above, the Contractor shall attach HEPA vacuum systems or other devices to the bag to prevent collapse during removal of ACM from straight runs of piping and elbows and other connections.

b. The negative pressure glove boxes used to remove ACM from pipe runs shall be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure shall be created in the system using a HEPA filtration system. The box shall be smoke tested for leaks prior to each use.

3.6.5.3 Mini-Enclosures

Mini-containment (small walk-in enclosure) to accommodate no more than 2 persons, may be used if the disturbance or removal can be completely contained by the enclosure with the Class I work procedures. The mini-enclosure shall be inspected for leaks and smoke tested before each use. Air movement shall be directed away from the employee's breathing zone within the mini-enclosure.

3.6.6 Class II Work

In addition to the requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the work.

b. For indoor work, critical barriers shall be placed over all openings to the regulated area.

c. Impermeable dropcloths shall be placed on surfaces beneath all removal activity.

3.6.7 Specific Control Methods for Class II Work

In addition to requirements of paragraph Class II Work, Class II work shall be performed using the following methods:

3.6.7.1 Vinyl and Asphalt Flooring Materials

Resilient sheeting shall be removed by adequately wet methods. Tiles shall be removed intact (if possible); wetting is not required when tiles are heated and removed intact. Flooring or its backing shall not be sanded. Scraping of residual adhesive and/or backing shall be performed using wet methods. Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Dry sweeping is prohibited. The Contractor shall use vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) to clean floors.

3.6.7.2 Other Class II Jobs

The Contractor shall use the following work practices when performing Class II removal of ACM listed in Table 1: The material shall be thoroughly wetted with amended water prior and during its removal. The material shall be removed in an intact state. Cutting, abrading or breaking the material is prohibited. The ACM removed shall be immediately bagged or wrapped.

3.6.8 Cleaning After Asbestos Removal

After completion of all asbestos removal work, surfaces from which ACM has been removed shall be wet wiped or sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through a dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger, and a final filter provided that removes fibers 5 micrometers and larger. After the gross amounts of asbestos have been removed from every surface, remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans, and HEPA vacuum cleaners as appropriate to maintain the integrity of the regulated area. When TSI and surfacing material has been removed, workmen shall use HEPA vacuum cleaners to vacuum every surface. Surfaces or locations which could harbor accumulations or residual asbestos dust shall be checked after vacuuming to verify that no asbestos-containing material remains; and shall be re-vacuumed as necessary to remove the ACM.

3.6.9 Abatement of Asbestos Contaminated Soil

This paragraph is only applicable in case of accidental spillage by the Contractor. Asbestos contaminated soil shall be removed from areas to a minimum depth of 2 inches. Soil shall be thoroughly dampened with amended water and then removed by manual shoveling into labeled containers. The workers shall be closely monitored for heat exhaustion. The minimum ventilation shall be 8 air changes per hour through a local exhaust HEPA system.

3.6.10 Sealing Contaminated Items Designated for Disposal

Contaminated architectural appurtenances designated for removal and items in the building that are contaminated by the Contractor during execution of work shall be coated with an asbestos lockdown encapsulant at the demolition site before being removed from the asbestos control area. These items shall not be vacuumed prior to application of the lockdown encapsulant. The asbestos lockdown encapsulant shall be tinted a contrasting color and shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.7 FINAL CLEANING AND VISUAL INSPECTION

Upon completion of abatement, the regulated area shall be cleaned by collecting, packing, and storing all gross contamination. A final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area.Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection and final air clearance monitoring. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection. If the Contracting Officer rejects the clean regulated area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Recleaning and follow-up reinspection shall be at the Contractor's expense.

3.8 LOCKDOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.9 EXPOSURE ASSESSMENT AND AIR MONITORING

3.9.1 General Requirements For Exposure

Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926, Section .1101, the Contractor's air monitoring plan, and as specified. Personal exposure air monitoring (collected at the breathing zone) that is representative of the exposure of each employee who is assigned to work within a regulated area shall be performed by the Contractor's IHT. Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section. Preabatement and abatement environmental air monitoring shall be performed by the Contractor's IHT, under the direction of the Designated IH. Final clearance environmental air monitoring, shall be performed by the Contractor's Designated IHT. Environmental and final clearance air monitoring shall be performed using NIOSH Pub No. 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH Pub No. 84-100 Method 7402 (TEM). For environmental and final clearance, air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc. Confirmation of asbestos fiber concentrations (asbestos f/cc) from environmental and final clearance samples collected and analyzed by NIOSH Pub No. 84-100 Method 7400 (total f/cc) may be conducted using TEM in accordance with NIOSH Pub No. 84-100 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH

Pub No. 84-100 Method 7400 PCM analysis. For all Contractor required environmental or final clearance air monitoring, confirmation of asbestos fiber concentrations, using NIOSH Pub No. 84-100 Method 7402, shall be at the Contractor's expense. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. Results of breathing zone samples shall be posted at the job site and made available to the COR. The Contractor shall maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the COR to determine the cause. At the discretion of the COR, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, the Contractor shall stop work immediately, notify the COR, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the COR.

3.9.2 Initial Exposure Assessment

The Contractor's IHT shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. If Class I asbestos work is required, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of PELs, or otherwise makes a negative exposure assessment, the Contractor shall presume that employees are exposed in excess of the PEL-TWA and PEL-Excursion Limit.

3.9.3 Negative Exposure Assessment

The Contractor shall provide a negative exposure assessment for the specific asbestos job which will be performed. The negative exposure assessment shall be provided within 1 day of the initiation of the project and conform to the following criteria:

a. Objective Data: Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the PEL-TWA and PEL-Excursion Limit under those work conditions having the greatest potential for releasing asbestos.

b. Prior Asbestos Jobs: Where the Contractor has monitored prior asbestos jobs for the PEL and the PEL-Excursion Limit within 12 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material,

control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.

c. Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

3.9.4 Preabatement Environmental Air Monitoring

Preabatement environmental air monitoring shall be established 1 day prior to the masking and sealing operations for each regulated area to determine background concentrations before abatement work begins. As a minimum, preabatement air samples shall be collected using NIOSH Pub No. 84-100 Method 7400, PCM at these locations: (1) outside the building; (2) inside the building, but outside the regulated area perimeter; and (3) inside each regulated work area. One sample shall be collected for every 2000 square feet of floor space. At least 2 samples shall be collected outside the building: at the exhaust of the HEPA unit; and downwind from the abatement site. The PCM samples shall be analyzed within 24 hours; and if any result in fiber concentration greater than 0.01 f/cc, asbestos fiber concentration shall be confirmed using NIOSH Pub No. 84-100 Method 7402 (TEM).

3.9.5 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the COR, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; preabatement sampling locations; outside entrances to a regulated area; close to glovebag operations (if applicable); representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used). If the sampling outside regulated area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, work shall be stopped immediately, and the COR notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the COR.

3.9.6 Final Clearance Air Monitoring

Prior to conducting final clearance air monitoring, the Contractor and the COR shall conduct a final visual inspection of the regulated area where asbestos abatement has been completed. The final visual inspection shall be as appended herein. Final clearance air monitoring shall not begin until acceptance of the Contractor's final cleaning by the COR. The

Contractor's IHT shall conduct final clearance air monitoring using aggressive air sampling techniques as defined in EPA 560/5-85-024 or as otherwise required by federal or state requirements. The sampling and analytical method used will be NIOSH Pub No. 84-100 Method 7400 (PCM) and Table 3 with confirmation of results by NIOSH Pub No. 84-100 Method 7402 (TEM).

3.9.6.1 Final Clearance Requirements, NIOSH PCM Method

For PCM sampling and analysis using NIOSH Pub No. 84-100 Method 7400, the fiber concentration inside the abated regulated area, for each airborne sample, shall be less than 0.01 f/cc. The abatement inside the regulated area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 total f/cc, the asbestos fiber concentration (asbestos f/cc) shall be confirmed from that same filter using NIOSH Pub No. 84-100 Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.01 asbestos f/cc, abatement is incomplete and cleaning shall be repeated. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria shall be done.

3.9.6.2 Air Clearance Failure

If clearance sampling results fail to meet the final clearance requirements, the Contractor shall pay all costs associated with the required recleaning, resampling, and analysis, until final clearance requirements are met.

3.9.7 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 24 hours (environmental/clearance monitoring) after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal and the Contractor's IHT and Designated CIH. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample:

a. Sampling and analytical method used;

b. Date sample collected;

c. Sample number;

d. Sample type: BZ = Breathing Zone (Personal), P = Preabatement, E = Environmental, C = Abatement Clearance;

e. Location/activity/name where sample collected;

f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);

g. Calibration date, time, method, location, name of calibrator, signature;

h. Sample period (start time, stop time, elapsed time (minutes);

i. Total air volume sampled (liters);

j. Sample results (f/cc) for final clearance;

k. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block for the IHT who conducted the sampling and for the CIH who reviewed the daily air monitoring log verifying the accuracy of the information.

3.10 CLEARANCE CERTIFICATION

When asbestos abatement is complete, ACM waste is removed from the regulated areas, and final clean-up is completed, the COR will certify the areas as safe before allowing the warning signs and boundary warning tape to be removed. After final clean-up and acceptable airborne concentrations are attained, but before the HEPA unit is turned off and the containment removed, the Contractor shall remove all pre-filters on the building HVAC system and provide new pre-filters. The Contractor shall dispose of such filters as asbestos contaminated materials. HVAC, mechanical, and electrical systems shall be re-established in proper working order. The Contractor and the COR shall visually inspect all surfaces (within the containment, if applicable) for residual material or accumulated debris. The Contractor shall reclean all areas showing dust or residual materials. The Contracting Officer will certify in writing that the area is safe before unrestricted entry is permitted. The Government will have the option to perform monitoring to certify the areas are cleaned.

3.11 CLEANUP AND DISPOSAL

3.11.1 Title to ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall be disposed of by the Contractor as specified and in accordance with applicable federal, state and local regulations.

3.11.2 Collection and Disposal of Asbestos

All ACM waste shall be collected and including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, shall be collected and placed in leak-tight containers such as double plastic bags; sealed double wrapped polyethylene sheet; sealed fiberboard boxes; or other approved containers. Waste within the containers shall be wetted in case the container is breeched. Asbestos-containing waste shall be disposed of state and local approved asbestos landfill. For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards.

3.11.3 Scale Weight Measurement

Scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of Texas. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear

a plainly legible identification mark.

3.11.4 Weigh Bill and Delivery Tickets

Copies of weigh bills and delivery tickets shall be submitted to the COR during the progress of the work. The Contractor shall furnish the Contracting Officer scale tickets for each load of ACM weighed and certified. These tickets shall include tare weight; identification mark for each vehicle weighed; and date, time and location of loading and unloading. Tickets shall be furnished at the point and time individual trucks arrive at the worksite. A master log of all vehicle loading shall be furnished for each day of loading operations. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified tickets and manifests of all ACM actually disposed by the Contractor for this contract.

3.11.5 Asbestos Waste Shipment Record

The Contractor shall complete and provide the COR final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill. Waste manifest shall be signed by a representative of DPW-Environmental who has signature authority. Each Waste Shipment Record shall be signed and dated by the Contractor, COR, the waste transporter and disposal facility operator.

TABLE 1-A

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90050 (Fire Station)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90050-1
2. LOCATION OF WORK TASK: B/90050 Ceiling
3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED:Suspended Sheetrock, Tape and Joint Mud

   a. Type of Asbestos: Chrysotile
   b. Percent asbestos content: ranged from 0.75% to 3.0%

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: Class I
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: Friable, Category II

7. FORM: IA and CONDITION OF ACM: FAIR
8. QUANTITY: SQUARE METERS: 10 (Approx.)

NOTES:
(1) Numeric sequence of individual work tasks (1,2,3,4, etc.) for each regulated area. Each category of EPA friability/OSHA class has a separate task.
(2) Specific location of work (building, floor, area, e.g., Building 1421, 2nd Floor, Rm 201)
(3) A description of material to be abated (example: horizontal pipe, cement wall panels, tile, stucco, etc.) type of asbestos (chrysotile, amosite, crocidolite, etc.); and % asbestos content.
(4) Technique to be used: Removal = REM; Encapsulation = ENCAP; Encasement = ENCAS; Enclosure = ENCL; Repair = REP.
(5) Class designation: Class I, II, III, or IV (OSHA designation).
(6) Friability of materials: Check the applicable EPA NESHAP friability designation.
(7) Form: Interior or Exterior Architectural = IA or EA; Mechanical/Electrical = ME.
Condition: Good = G; Fair = F; Poor = P.
(8) Quantity of ACM for each work task in meters or square meters.

TABLE 1-B

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90050 (Fire Station)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90050-2

2. LOCATION OF WORK TASK: Restroom pipe chase, behind wall

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: Pipe insulation on less than 4-inch diameter pipe.

   a. Type of Asbestos: Presumed asbestos containing material
   b. Percent asbestos content: access problem, no sample collected

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS I
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: friable, Category II

7. FORM: IA and CONDITION OF ACM: PACM, no information
8. QUANTITY: 20 METERS (Approx.)

TABLE 1-C

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90049 (Control Tower & Ops Bldg)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90049-1

2. LOCATION OF WORK TASK: Mechanical Room, Basement and 7th Floor (Tower)

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: Flexible Connector

   a. Type of Asbestos: Chrysotile
   b. Percent asbestos content: ranged from 7% to 50%

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS II
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: Non-friable, Category II
7. FORM: IA and CONDITION OF ACM: GOOD
8. QUANTITY: 2.1 SQUARE METERS (Approx.); 6 each (in Basement) and 4 each (on 7th Floor).

TABLE 1-D

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90049 (Control Tower & Ops Bldg)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90049-2

2. LOCATION OF WORK TASK: ENTIRE BUILDING

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: 12-inch by 12-inch Floor Tile and Mastic lay on top of 9-inch by 9-inch Floor Tile and mastic

a. Type of Asbestos: Floor Tile (non-detect for asbestos); Mastic has Chrysotile
b. Percent asbestos content: ranged from 5% to 7%, mastic

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS II
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: Non-friable, Category I

7. FORM: IA and CONDITION OF ACM: GOOD
8. QUANTITY: 1875 SQUARE FEET (Approx., including both tile and mastic)

Remarks: Floor tile is not removed with the building structures because it is contaminated by the 9" by 9" floor tile and mastic (in poor condition).

TABLE 1-E

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90049 (Control Tower & Ops Bldg)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90049-3

2. LOCATION OF WORK TASK: ENTIRE BUILDING

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: 9-inch by 9-inch Floor Tile and Mastic covered by 12-inch by 12-inch Floor Tile and mastic

   a. Type of Asbestos: Chrysotile
   b. Percent asbestos content: Tile and Mastic both contain 5%

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS II
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: Non-friable, Category I

7. FORM: IA and CONDITION OF ACM: POOR
8. QUANTITY: 1875 SQUARE FEET (Approx., including both tile and mastic)

TABLE I-F

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90049 (Control Tower & Ops Bldg)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90049-4

2. LOCATION OF WORK TASK: Window Casing at Mechanical Room, Basement

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: Window caulking

   a. Type of Asbestos: Chrysotile
   b. Percent asbestos content: 3%

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS II
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: Non-friable, Category II

7. FORM: IA and CONDITION OF ACM: FAIR
8. QUANTITY: 1.2 SQUARE METER (Approx.)

TABLE 1-G

INDIVIDUAL WORK TASK DATA ELEMENTS

BUILDING 90049 (Control Tower & Ops Bldg)

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER: 90049-5

2. LOCATION OF WORK TASK: Mechanical Room, 6th Floor (Tower)

3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: 4-inch diameter pipe canvas wrap with powder insulation

a. Type and Percent of Asbestos: Chrysotile (15%) and Amosite (25%)

4. ABATEMENT TECHNIQUE TO BE USED: REM
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK: CLASS I
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK: friable, Category II

7. FORM: IA and CONDITION OF ACM: GOOD
8. QUANTITY: 12 METER (Approx.)

TABLE 2

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

Fibers/cc(01.95 percent CL) = X + (X) * (1.645) * (CV)

Where: X = ((E)(AC))/((V)(1000))

E = ((F/Nf) - (B/Nb))/Af

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

TWA = C1/T1 + C2/T2 = Cn/Tn

Where: C = Concentration of contaminant

T = Time sampled.

TABLE 3

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol. (Note 2) (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	0.5/140 Square Meters (Notes 3 & 4)	0.45 microns	3850	2-16
Each Room in 1 Abatement Area Less than 140 Square meters		0.45 microns	3850	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.

2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.

3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).

4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.

TABLE 4

CERTIFICATION OF FINAL CLEANING AND VISUAL INSPECTION

A separate inspection shall be applicable to each abatement work task. In accordance with the cleaning and decontamination procedures specified in the Contractor's Asbestos Hazard Abatement Plan and this contract. The Contractor hereby certifies that he/she has thoroughly visually inspected the decontaminated regulated area (all surfaces, including pipes, beams, ledges, wall, ceiling, floor, decontamination units, etc.) In accordance with ASTM E1368, Standard Practice for Visual Inspection of Asbestos Abatement Projects, has found no dust, or asbestos-containing material residue.

Contractor's Signature: Date:

Print Name and Title:

Contractor's On-site Supervisor's Signature:

Print Name and Title:

Contractor's Designated CIH's Signature:

Print Name and Title:

Contractor's IHT's Signature:

Print Name and Title:

CONTRACTING OFFICER REPRESENTATIVE (COR) ACCEPTANCE OR REJECTION

I hereby determine that the Contractor has performed final cleaning and visual inspection of the decontaminated regulated work area (all surfaces including beams, ledges, wall, ceiling, floor, decontamination units, etc.) And by quality assurance inspection, find the Contractor's final cleaning to be:

_____Acceptable

_____Unacceptable, Contractor instructed to reclean the regulated area

COR's Signature: Date:

Print Name and Title:

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____
CONTRACTOR FIRM NAME _____
EMPLOYEE'S NAME _____,_____,_____,
(Print) (Last) (First) (MI)

Social Security Number: _____-_____-_____,

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided and you complete formal asbestos training specific to the type of work you will perform and project specific training; that you be supplied with proper personal protective equipment including a respirator, that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you. The Contractor's Designated Industrial Hygienist will check the block(s) for the type of formal training you have completed. Review the checked blocks prior to signing this certification.

FORMAL TRAINING:
_____ a. For Competent Persons and Supervisors: I have completed EPA's Model Accreditation Program (MAP) training course, "Contractor/Supervisor", that meets this State's requirements.

b. For Workers:
_____ (1) For OSHA Class I work: I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (2) For OSHA Class II work (where there will be abatement of more than one type of Class II materials, i.e., roofing, siding, floor tile, etc.): I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
(3) For OSHA Class II work (there will only be abatement of one type of Class II material):
_____ (a) I have completed an 8-hour training class on the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls of 29 CFR 1926, Section .1101(g) and hands-on training.
_____ (b) I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (4) For OSHA Class III work: I have completed at least a 16-hour course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101, and hands-on training.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:
_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Industrial Hygienist and Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:
_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:
_____ I have been trained in the proper selection, fit, use, care, cleaning,maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION:
_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's Industrial Hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.
_____ were identified physical limitations to performing the required work tasks.

Date of the medical examination _____

Employee Signature _____ date _____
Contractor's Industrial
Hygienist Signature _____ date _____

-- End of Section --

BASE BID

QUEST
MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
214.351.4441 Fax 214.351.4487

PLM REPORT

NVLAP Lab No. 200249
TDH License No. 30-0218

Client: U.S. Army Corps of Engineers

Request No.: 003847

Project: Fixed Wing Aircraft, Ft. Hood Building 90079

Date: 11/23/99

Project No.: 93190877

Sample Date: 11/17/99

Identification: Polarized Light Microscopy/Dispersion Staining (PLM/DS)

Test Method: Method 40 CFR, Ch. 1, Part 763, Subpart F, Appendix A

On 11/19/99, fifteen (15) bulk samples were submitted by Kathleen Wu of the U.S. Army Corps of Engineers for PLM/DS asbestos analysis. The results are outlined below:

Client No.	Lab No.	Sample Description	Fibrous Components	Asbestos Content
90079-A01	9-14097	Tan Putty around Door Frame	None	None Detected
90079-A02	9-14098	White Putty between CMU Joints	2% Cellulose	None Detected
90079-A03	9-14099	12"x12" Brown Speckled Floor Tile (A) with Black Mastic (B)	None	A) None Detected B) 5% Chrysotile
90079-A04	9-14100	Beige Putty around Door Frame	3% Wollastonite	None Detected
90079-A05	9-14101	Sheetrock, Joint Compound, Tape	NA	<0.25% Chrysotile by Point Count
90079-A06	9-14102	Sheetrock, Joint Compound, Tape	NA	<0.25% Chrysotile by Point Count
90079-A07	9-14103	Grey Putty around Window	None	None Detected
90079-A08	9-14104	White Putty around Door	2% Cellulose	None Detected
90079-A09	9-14105	Beige Vinyl Baseboard (A) with Tan Mastic (B)	None	A) None Detected B) None Detected
90079-A10	9-14106	Rolled Roofing (A), Felt Paper (B) and Black Tar (C), Main Building	A) 20% Fiberglass B) 35% Fiberglass	A) None Detected B) None Detected C) None Detected
90079-A11	9-14107	Rolled Roofing (A), Felt Paper (B) and Black Tar (C), Control Tower	A) 25% Fiberglass B) 40% Fiberglass	A) None Detected B) None Detected C) None Detected
90079-A12	9-14108	Black Tar around Vent	None	20% Chrysotile
90079-A13	9-14109	12"x12" Brown Speckled Beige Floor Tile (A) with Black Mastic (B)	None	A) None Detected B) 5% Chrysotile
90079-A14	9-14110	12"x12" Brown Speckled Beige Floor Tile (A) with Black Mastic (B)	None	A) None Detected B) 5% Chrysotile
90079-A15	9-14111	Laminate Counter Top with Clear Coating on Wood	70% Cellulose	None Detected

The EPA test method for bulk analysis (EPA/600/R-93/116) states in paragraph 2.2.2 that "the detection limit for visual estimation is a function of the quantity of the sample analyzed, the nature of the matrix interference, sample preparation, and fiber size and distribution. Asbestos may be detected in concentrations of less than one percent by area if sufficient material is analyzed. Samples may contain fibers too small to be resolved by PLM (<0.25 micrometers in diameter) so detection of those fibers by this method may not be possible."

Samples are analyzed by layers, and percentages estimated visually during microscopic examination. Samples will be archived for a minimum of 90 days following analysis, and individual analysis sheets are available upon request. Results may not be reproduced except in full. This test report relates only to the samples tested, and results must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Jennifer Jaber

Lab Director: Jennifer Jaber

Approved Signatory: Jennifer Jaber

NVLAP

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: & 93190877	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90079, 90080, 90071	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu		
Phone No: 817/978-3977 ext1645	Electronic Data Format: Use .pdf	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix								
11/17/99	90079-A01 Putty around Door Frame	Solid							X	
11/17/99	90079-A02 Putty between Cmu Joints	Solid							X	
11/17/99	90079-A03 Floor Tile 12" X 12"	Solid							X	
	Beige w/Brown Specks, Black Mastic	Solid								
11/17/99	90079-A04 Putty around Door frame	Solid							X	
11/17/99	90079-A05 Sheetrock, Joint Compound, Tape	Solid						X		
11/17/99	90079-A06 Sheetrock, Joint Compound, Tape	Solid						X		
11/17/99	90079-A07 Putty around Window	Solid							X	
11/17/99	90079-A08 Putty around Door	Solid							X	

9-14097

Relinquished by: J. Hand	Date/Time: 11-18-99 1200	Received by: Jennifer Gibbs	Date/Time: 11/19/99 4:50pm
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT 003847

EV-DI FORM SEP 97

CHAIN OF CUSTODY RECORD

Lab. PR&C No.: 93190877	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90079, 90080, 90071	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu		
Phone No: 817/978-3977 ext1645	Electronic Data Format: Use .pdf	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix							
11/17/99	90079-A09 Vinyl Baseboard, Tan MASTIC	Solid							X
11/17/99	90079-A10 Rolled Roofing, Felt Paper Black Tar - Main Bldg.	Solid							X
11/17/99	90079-A11 Rolled Roofing, Felt Paper Black Tar - Control Tower	Solid							X
11/17/99	90079-A12 - Black Tar around Vent	Solid							X
11/17/99	90079-A13 12"X12" Floor Tile w/brown Specks & Black MASTIC	Solid							X

Relinquished by: J. Hall	Date/Time: 11-18-99 1200	Received by: Jennifer Ryan	Date/Time: 11/19/99 4:50pm
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

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CHAIN OF CUSTODY RECORD

Lab.PR&C No.: & 93190877	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90079, 90080, 90071	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu	Electronic Data Format: Use .pdf	FEDEX Acct. No.: 1128-3856-2
Phone No: 817/978-3977 ext1645		

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix								
11/17/99	90079-A14 12"X12" Floor Tile, Beige	Solid							X	
	w/Brown Specks, Black MASTIC									
11/17/99	90079-A15 Laminate Counter Top	Solid							X	9-14111
	w/clear coating on wood									

Relinquished by: J Hau	Date/Time: 1200 11-19-99	Received by: Jennifer Allen	Date/Time: 11/19/99 4:50pm
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT

QUEST
MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
214.351.4441 Fax 214.351.4487

PLM REPORT

NVLAP Lab No. 200249
TDH License No. 30-0218

Client: U.S. Army Corps of Engineers

Request No.: 003849

Project: Fixed Wing Aircraft, Ft. Hood Building 90080

Date: 11/23/99

Project No.: 93190877

Sample Date: 11/16/99

Identification: Polarized Light Microscopy/Dispersion Staining (PLM/DS)

Test Method: Method 40 CFR, Ch. 1, Part 763, Subpart F, Appendix A

On 11/19/99, five (5) bulk samples were submitted by Kathleen Wu of the U.S. Army Corps of Engineers for PLM/DS asbestos analysis. The results are outlined below:

Client No.	Lab No.	Sample Description	Fibrous Components	Asbestos Content
90080-A01	9-14112	Paint, Tape and Joint Compound	NA	0.00% Asbestos by Point Count
90080-A02	9-14113	Paint, Tape and Joint Compound	NA	0.00% Asbestos by Point Count
90080-A03	9-14114	12"x12" Brown Speckled Beige Floor Tile (A) with Tan Mastic (B)	B) 5% Cellulose	A) None Detected B) None Detected
90080-A04	9-14115	12"x12" Brown Speckled Beige Floor Tile (A) with Tan Mastic (B)	B) 5% Cellulose	A) None Detected B) None Detected
90080-A05	9-14116	Grey Vinyl Baseboard (A) with Tan Mastic (B)	None	A) None Detected B) None Detected

The EPA test method for bulk analysis (EPA/600/R-93/116) states in paragraph 2.2.2 that "the detection limit for visual estimation is a function of the quantity of the sample analyzed, the nature of the matrix interference, sample preparation, and fiber size and distribution. Asbestos may be detected in concentrations of less than one percent by area if sufficient material is analyzed. Samples may contain fibers too small to be resolved by PLM (<0.25 micrometers in diameter) so detection of those fibers by this method may not be possible."

Samples are analyzed by layers, and percentages estimated visually during microscopic examination. Samples will be archived for a minimum of 90 days following analysis, and individual analysis sheets are available upon request. Results may not be reproduced except in full. This test report relates only to the samples tested, and results must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Jennifer Jaber

Lab Director: Jennifer Jaber

Approved Signatory: Jennifer Jaber

NVLAP

CHAIN OF CUSTODY RECORD

Lab. PR&C No.: 893190877
Proj Mngr: Poy Har Kathleen Wu
Phone No: 817/978-3977 ext1645

Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90079, 90080, 90071
Electronic Data Format: Use .pdf

Site/Feature: Ft. Hood

FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
*PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix									
11/16/99	90080-A01 - Paint, Tape, Joint Compound	Solid						X			9-14112
11/16/99	90080-A02 Paint, Tape, Joint Compound	Solid						X			
11/16/99	90080-A03 12"X12" BEIGE w/brown	Solid							X		
	Specks - Floor Tile TAN MASTIC										
11/16/99	90080-A04 12"X12" Beige w/brown	Solid							X		
	Specks - Floor Tile, TAN MASTIC										
11/16/99	90080-A05 Vinyl Baseboard	Solid							X		9-14116
	Tan MASTIC										

Relinquished by: J. Hand	Date/Time: 1200 11-18-99	Received by: Jennifer Cyra	Date/Time: 11/19/99 4:50pm
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT 003849

EV-DI FORM SEP 97

BID OPTION NO. 1

QUEST

POINT COUNT REPORT

MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
Tel 214.351.4441 Fax 214.351.4487

NVLAP Lab No. 200249
TDH License No. 30-0218

Client: U.S. Army Corps of Engineers
Project: Fort Hood Building 90050
Project No. Fixed Wing Aircraft Park
Identification: Asbestos Bulk Sample Analysis
Test Method: Polarized Light Microscopy/Dispersion Staining(PLM/DS)/ Point Count EPA Method 600/R-93/116

Request No.: 002884
Report Date : 5/3/99
Sample Date: 4/13/99

On 4/27/99, 16 bulk samples were submitted b Jack Cronkrite of the USACE for Point Count analysis.
Copies of the lab data sheets are attached. The results are summarized below:

Client No	Lab No	Sample Description	Asbestos Content
A01	9-04474	White Texture on Sheetrock	0.00% Asbestos
A02	9-04475	White Texture on Sheetrock	0.00% Asbestos
A03	9-04476	White Texture on Sheetrock	0.00% Asbestos
A04	9-04477	Beige Texture on Ceiling Sheetrock	0.75% Chrysotile
A05	9-04478	2'x4' Drop Ceiling Tile	0.00% Asbestos
A06	9-04479	White Ceiling Texture on Sheetrock	0.00% Asbestos
A07	9-04480	White Caulking, Bathroom Sink	0.00% Asbestos
A08	9-04481	Old Ceiling Tile with Paint	0.00% Asbestos
A09	9-04482	Brown Floor Tile with Mastic	0.00% Asbestos
A10	9-04483	Brown Laminate Kitchen Top with Mastic	0.00% Asbestos
A11	9-04484	Beige Flexible Joint, Kitchen Heater	0.00% Asbestos
A12	9-04485	White Window Caulking, Kitchen	0.00% Asbestos
A13	9-04486	Black Caulk Concrete Expansion Joint	0.00% Asbestos
A14	9-04487	Tar Paper outside Wood Wall	0.00% Asbestos

A15	9-04488	Black Roll Roofing	0.00% Asbestos
A16	9-04489	Black Roofing Tar	0.25% Chrysotile

Asbestos percentage detemined by point count.
The asbestos content should be considered when establishing policy regarding these bulk materials.
Results may not be reproduced except in full. This test report relates only to the samples tested, and must not be used to imply endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Jennifer Jaber

Lab Director: Jennifer D. Jaber Approved Signatory Jennifer Jaber

NVLAP

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: 90989507	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90050	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu		
Phone No: 817/978-3977 ext1645	Electronic Data Format: Yes	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix	Dt. Ct.
13Apr99	90050-A01, Wallboard, Sheetrock, mud & TAPE	PACM	X
13Apr99	90050-A02, Wallboard, Sheetrock, mud & TAPE	PACM	X
13Apr99	90050-A03, Wallboard, Sheetrock, mud & TAPE	PACM	X
13Apr99	90050-A04, Ceiling, Sheetrock, mud & TAPE	PACM	X
13Apr99	90050-A05, Drop Ceiling, 2'x4' Tiles	PACM	X
13Apr99	90050-A06, Ceiling Sheetrock, Texture & Paint	PACM	X
14Apr99	90050-A07, Caulking, Bathroom Sink	PACM	X
14Apr99	90050-A08, Old Ceiling tile with Paint	PACM	X
14Apr99	90050-A09, Floor tile, with mastic, White Brown	PACM	X

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PROVIDE DATA IN BOTH HARD COPY AND ELECTRONIC FORMAT

002884

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: 90989507	Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90050	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu		
Phone No: 817/978-3977 ext1645	Electronic Data Format: Yes	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix	Pt. Ct.						
14Apr99	90050-A10, laminate Kitchen top/mastic	PACM	X						
14Apr99	90050-A11, Flexible joint Kitchen heater	PACM	X						
14Apr99	90050-A12, Window caulking Kitchen	PACM	X						
14Apr99	90050-A13, Concrete Expansion joint Caulk Between	PACM	X						
14Apr99	90050-A14 TAR Paper outside Wood Wall	PACM	X						
14Apr99	90050-A15, Roll roofing	PACM	X						
14Apr99	90050-A16, Roofing TAR and Fiber	PACM	X						
14Apr99	90050-L01, Building Material	PACM				X	?	FAX'd to 4/27/99	ETC
14Apr99	90050-L02, Wood, Paint, Gray Brown	PACM				X	?		

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EV-DI FORM SEP 97

EcoSystems Environmental, Inc.
Environmental Consulting Services

U.S. ARMY CORPS OF ENGINEERS
819 TAYLOR STREET, ROOM 4 CO4
FORT WORTH, TEXAS 76102-0300

PLM BULK ASBESTOS ANALYSIS (NVLAP NO. 101162, TDH LAB LICENSE NO. 30-0117)

POINT COUNTING PROCEDURE

5/18/1999

PROJECT: FIXED WING AIRCRAFT, BLDG. 90050

PROJECT NO.: 90989507

SAMPLE # /LAB	LOCATION OF SAMPLE/TYPE OF MATERIAL SAMPLED	LAYER(%)	NON-FIBROUS MATERIAL (%)	NON-ASBESTOS FIBROUS MATERIAL (%)	ASBESTOS TYPE (%)
90050-A04 99-27740	CEILING (SHEETROCK LAYER) FRIABLE	A 100	BINDER/ 90 GYPSUM CALCITE 2	CELL. 7 SYNTHETIC 1	NONE DET. 0 TOTAL 0*
90050-A04 99-27740	CEILING (TAPE & BED LAYER) FRIABLE	A 100	BINDER/ 95 CARBONATE QUARTZ 1	CELL. <2	CHRYSOTILE 2.5 TOTAL 2.5*
90050-A16 99-27740	ROOFING TAR & FIBER (BLACK) NON-FRIABLE	A 100	BINDER/ 80 BITUMEN	FIBER GLASS 15 CELL. <3	CHRYSOTILE 2.2 TOTAL 2.2*

* POINT COUNTING PROCEDURE WAS USED IN THE QUANTITATION OF ASBESTOS.

ANALYST: _____
BAKH DARGALI

1408A Vantage Drive • Carrollton, Texas 75006 • (972) 416-0520 • Fax (972) 416-4512

EcoSystems Environmental, Inc.
Environmental Consulting Services

POINT COUNTING PROCEDURE

POINT COUNTING IS PERFORMED FOR REGULATED ASBESTOS-CONTAINING MATERIALS UPON CLIENT'S REQUEST AS PER REGULATIONS OF "NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS; ASBESTOS NESHAP REVISION; FINAL RULE". THE POINT COUNTING FOR THE QUANTITATION OF ASBESTOS IS CONDUCTED IN ACCORDANCE WITH THE PROCEDURE OUTLINED IN U.S. ENVIRONMENTAL PROTECTION AGENCY: 40 CODE OF FEDERAL REGULATIONS CHAPTER I (1-1-87 EDITION) PART 763, SUB-PART F, APPENDIX A.

AN OCULAR RETICLE (CROSS HAIR) IS USED TO VISUALLY SUPERIMPOSE A POINT OR POINTS ON THE MICROSCOPE FIELD OF VIEW. THE NUMBER OF POINTS POSITIONED DIRECTLY ABOVE EACH KIND OF PARTICLE OR FIBER OF INTEREST ARE RECORDED. ONLY POINTS DIRECTLY OVER ASBESTOS FIBERS OR NON-ASBESTOS MATERIAL ARE SCORED. IF AN ASBESTOS FIBER AND A MATRIX PARTICLE OVERLAP SO THAT A POINT IS SUPERIMPOSED ON THEIR VISUAL INTERSECTION, A POINT IS SCORED FOR BOTH CATEGORIES. POINT COUNTING PROVIDES A DETERMINATION OF THE AREA PERCENT OF ASBESTOS. RELIABLE CONVERSION OF AREA PERCENT TO DRY WEIGHT IS NOT CURRENTLY FEASIBLE.

A TOTAL OF 400 POINTS SUPERIMPOSED ON EITHER ASBESTOS FIBERS OR NON-ASBESTOS MATRIX MATERIAL ARE COUNTED OVER AT LEAST EIGHT DIFFERENT PREPARATIONS OF REPRESENTATIVE SUB-SAMPLES. EIGHT FORCEP SAMPLES ARE EACH MOUNTED SEPARATELY WITH THE APPROPRIATE REFRACTIVE INDEX LIQUID. THE SAMPLES ARE PREPPED IN A WAY THAT THEY ARE UNIFORMLY DISPERSED TO AVOID OVERLAPPING PARTICLES AND TO ALLOW 25-50% EMPTY AREA WITHIN THE FIELDS OF VIEW. 50 NON-EMPTY POINTS ARE COUNTED ON EACH PREPARATION BY USING CHALKY POINT ARRAY IN AT LEAST TWO RANDOMLY SELECTED FIELDS. QUANTITATION IS PERFORMED AT THE MAGNIFICATION OF 100X OF THE POLARIZED LIGHT MICROSCOPE AS THE SAMPLE COMPONENTS CAN BE EASILY DISTINGUISHED.

THE PERCENTAGE OF ASBESTOS IS CALCULATED AS FOLLOWS:

% OF ASBESTOS= (A/N)100%

A= NUMBER OF ASBESTOS COUNTS

N= NUMBER OF NON-EMPTY POINTS COUNTED

IF A =0 "NONE DETECTED" WILL BE REPORTED

IF 0<A<3 <1% ASBESTOS WILL BE REPORTED

IF A>3 THE VALUE OF ASBESTOS WOULD BE ROUNDED TO THE NEAREST PERCENT (FOR SAMPLES YIELDING BEWTWEEN 1 & 2 % OF ASBESTOS THE ACTUAL DECIMAL NUMBER WOULD BE REPORTED).

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EcoSystems Environmental, Inc.
Environmental Consulting Services

BULK SAMPLE ANALYSES: *ASBESTOS*

BACKGROUND:

EcoSystems Environmental, Inc. (ESEI) is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) *-Laboratory ID # 101162-* through the National Institute of Standards and Technology (NIST). ESEI is also licensed and authorized to perform as an asbestos laboratory by the Texas Department of Health *(License No. 30-0117)*. *ESEI* is a Charter member of *North Texas Asbestos Analyst Association's* (NTA^3) Quality Control Program.

METHOD & LAYERING:

Bulk samples are prepared and analyzed in accordance with the polarized light microscopy procedures outlined in the *EPA/600/R-93/116* or the EPA method, under AHERA. *The test report relates only to the samples submitted for analysis. ESEI's laboratory accreditation or any of its test results in no way implies product certification, approval, or endorsement by NIST or any agency of the U.S. Government. The test reports can not be reproduced except in full and with ESEI's permission.*

When a sample consists of two or more distinct layers or materials, each layer is analyzed and reported separately. Any layer containing more than 1% asbestos is declared by the National Emission Standards for Hazardous Air Pollutants (NESHAP) as an *asbestos-containing material (ACM).*

PERCENTAGES & POINT COUNTING

Reported percentages of asbestos are visual estimates by volume; quantitation is achieved by utilizing a stereobinocular microscope. The Asbestos NESHAP Revision Final Rule states that regulated asbestos-containing materials (as defined in 40 CFR Section 61.141) containing less than 10% asbestos *(including the samples that contain a trace or less than 1% asbestos which are considered by the EPA as asbestos-containing materials if analyzed by Polarized Light Microscopy (PLM)* may be verified by *point counting.* If the lab detects the asbestos content of a sample to be $<10\%$, the client may: 1) elect to assume the amount to be greater than 1% and treat the material as asbestos containing or 2) require the verification of the amount by point counting. If a result obtained by point counting is different from a result obtained by visual estimation, *the point count result will be used. Samples for which no asbestos is detected by the PLM do not need to be point counted.*

TYPES OF ASBESTOS:

Asbestos is a general term to one of several naturally occurring fibrous minerals. These are divided into two categories: serpentine and amphiboles. **chrysotile**, a serpentine, is the most commonly found form of asbestos. The five other types are all amphiboles. These include **amosite**, (fibrous grunerite), **crocidolite** (fibrous riebeckite), fibrous **anthophyllite**, fibrous **tremolite** and fibrous **actinolite**.

BACKGROUND MATERIALS:

Materials which do not contain Asbestos are reported for each sample. These background materials are divided into Fibrous and non-fibrous types. Common Fibrous materials include glass, mineral wool, cellulose, paper, and synthetics (nylon, rayon, Dacron). Common non-fibrous materials include binder (glues), mica, quartz, vermiculite, clays, lizardite and talc.

SAMPLE STORAGE:

Bulk samples are double bagged and stored for 90 days unless otherwise arranged with the client. Samples can be returned within 90 day period upon receipt of written authorization and payment of a return fee.

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CHAIN OF CUSTODY RECORD

Lab.PR&C No.: % 90989507	Proj/Instal'n: Fixed Wing Aircraft	Site/Feature: Ft. Hood
Proj Mngr: Poy Har Kathleen Wu	Park, Bldg. 90050	
Phone No: 817/978-3977 ext1645	Electronic Data Format: NO	FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods — Turn-around Time in Days

PLM-Point Count EPA 600/R-93/116 — 3-5

NOTE: Report Friability of asbestos in PLM REPORT - on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix								
14-MAY-99	90050-A04 /CEILING, SHEETROCK, MUD, AND TAPE	PACM						X		
14-MAY-99	90050-A16 /ROOFING TAR AND FIBER	PACM						X		

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Relinquished by:	Date/Time:	Received for lab by:	Date/Time:

[redacted]

TEXAS
DEPARTMENT OF HEALTH

BE IT KNOWN THAT

ECOSYSTEMS ENVIRONMENTAL, INC.

is Licensed and authorized to perform as an

Asbestos Laboratory

PLM, PCM

in the State of Texas within the purview of Texas Civil Statutes, Article 4477-3a, as amended, so long as this License is not suspended or revoked and is renewed according to the rules adopted by the Texas Board of Health.

30-0117
License Number

11/02/1998
Issue Date

11/01/1999
Expiration Date

This certificate is void after expiration date.

Todd F. Wingler, P.E.
Chief, Asbestos Programs Branch
Occupational Safety and Health Division

William R. Archer III, M.D.
Commissioner of Health

VOID IF ALTERED NON-TRANSFERABLE

40998

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation

ECOSYSTEMS ENVIRONMENTAL, INC.
CARROLLTON, TX

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

March 31, 2000
Effective through

For the National Institute of Standards and Technology

NVLAP Lab Code: 101162-0

NVLAP-01C (11-95)

BID OPTION NO. 2

QUEST

MicroAnalytics, Inc.
2530 Electronic Lane, Suite 712
Dallas, Texas 75220-1229
Tel 214.351.4441 Fax 214.351.4487

PLM REPORT

NVLAP Lab No. 200249
TDH License No.30-0218

Client: U.S. Army Corps of Engineers
Project: Fort Hood Fixed Wing Aircraft Park
Project No. Building 90049

Request No.: 004062
Report Date: 1/12/00
Sample Date: 1/05/00

Identification: Polarized Light Microscopy/Dispersion Staining (PLM/DS)
Test Method: Method 40 CFR, Ch. 1, Part 763, Subpart F, Appendix A

On 1/07/00, 21 bulk material samples were submitted by Janie Hard of the U.S. Army Corps of Engineers for PLM/DS analysis. The results are outlined below:

Client No.	Lab No.	Sample Description	Fibrous Components	Asbestos Content
A01	0-00200	Gray Window Caulking between Panes	None	None Detected
A02	0-00201	Gray Canvas Flex Connector	30% Cotton 25% Synthetic Fibers	40% Chrysotile
A03	0-00202	Beige Stucco Wall	NA	0.00% Asbestos by Point Count
A04	0-00203	12"x12" Tan Speckled Beige Floor Tile (A) with Black Mastic (B)	None	A) None Detected B) 7% Chrysotile
A05	0-00204	Tape, Sheetrock and Mud	NA	0.00% Asbestos by Point Count
A06	0-00205	12"x12" Tan Floor Tile (A) with Black Mastic (B)	None	A) None Detected B) 5% Chrysotile
A07	0-00206	Beige Flex Connector	45% Synthetic Fibers	50% Chrysotile
A08	0-00207	9"x9" Beige Floor Tile (A) with Black Mastic (B)	None	A) 5% Chrysotile B) 5% Chrysotile
A09	0-00208	Brown Fibrous Sub-Flooring Wood	99% Cellulose	None Detected
A10	0-00209	Sheetrock, Tape and Mud	NA	0.00% Asbestos by Point Count
A11	0-00210	Sheetrock, Tape and Mud	NA	0.00% Asbestos by Point Count
A12	0-00211	Black Flashing around Vent	3% Cellulose	None Detected
A13	0-00212	Roof Tar (A) and Roll Roofing (B)	B) 25% Synthetic	A) None Detected B) None Detected
A14	0-00213	Black Flashing around Vent	3% Cellulose	None Detected
A15	0-00214	White Hard Window Caulking	None	3% Chrysotile
A16	0-00215	White Rubbery Window Caulking	None	None Detected

A17	0-00216	White Rubbery Window Caulking	None	None Detected
A18	0-00217	White Pipe Insulation	None	25% Amosite 15% Chrysotile
A19	0-00218	Flex Connector	45% Synthetic Fibers	50% Chrysotile
A20	0-00219	Flex Connector	45% Synthetic Fibers	50% Chrysotile
A21	0-00220	Beige Plaster Wall	NA	0.00% Asbestos by Point Count

The EPA test method for bulk analysis (EPA/600/R-93/116) states in paragraph 2.2.2. that "the detection limit for visual estimation is a function of the quantity of the sample analyzed, the nature of matrix interference, sample preparation, and fiber size and distribution. Asbestos may be detected in concentrations of less than one percent by area if sufficient material is analyzed. Samples may contain fibers too small to be resolved by PLM (<0.25 micrometers in diameter) so detection of those fibers by this method may not be possible."

Samples are analyzed by layers, and percentages estimated visually during microscopic examination. Individual analysis sheets available upon request. Results may not be reproduced except in full. This test report relates only to the samples tested, and results must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Samples will be stored for a minimum of 90 days, after which time they will be disposed of unless notified by the client in writing. (Storage fees apply.)

Analyst: Alexis O'Reilly

Lab Director: Jennifer D. Jaber Approved Signatory Jennifer Jaber

NVLAP

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: % 93190877
Proj Mngr: Poy Har Kathleen Wu
Phone No: 817/978-3977 ext1645

Proj/Instal'n: Fixed Wing Aircraft
Park. Bldg. 90049
Electronic Data Format: Use .pdf

Site/Feature: Ft. Hood
FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	(3-5)
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT – on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix	PLM-Point Count	PLM
1/5/2000	90049-A01 Window Caulking Between Panes	Solid		X
1/5/2000	90049-A02 · Gray Canvas Flex Connector	Solid		X
1/5/2000	90049-A03 · Stucco Wall	Solid	X	
1/5/2000	90049-A04 - 12"X12" Floor Tile Beige w/Tan Specs & black mastic	Solid		X
1/5/2000	90049-A05 Tape, Sheetrock & mud	Solid	X	
1/5/2000	90049-A06 Tan Floor Tile 12"X12" w/ black mastic	Solid		X

0-00200

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EV-DI FORM SEP 97

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: % 93190877
Proj Mngr: Poy Har Kathleen Wu
Phone No: 817/978-3977 ext1645

Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90049
Electronic Data Format: Use .pdf

Site/Feature: Ft. Hood

FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT – on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix										
1/5/2000	90049-A07 Flex Connector (Beige)	Solid									X	
1/5/2000	90049-A08 9"X9" Floor Tile Beige w/ black MASTIC	Solid									X	
1/5/2000	90049-A09 Brown fibrous sub-flooring wood	Solid										
1/5/2000	90049-A10 Sheetrock, tape & mud	Solid								X		
1/5/2000	90049-A11 Sheetrock, Tape & mud	Solid								X		
1/5/2000	90049-A12 Flashing around vent	Solid									X	
1/5/2000	90049-A13 Roof Tar & Roll Roofing	Solid									X	

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EV-DI FORM SEP 97

CHAIN OF CUSTODY RECORD

Lab.PR&C No.: % 93190877
Proj Mngr: Poy Har Kathleen Wu
Phone No: 817/978-3977 ext1645

Proj/Instal'n: Fixed Wing Aircraft Park, Bldg. 90049
Electronic Data Format: Use .pdf

Site/Feature: Ft. Hood

FEDEX Acct. No.: 1128-3856-2

Analytes/Test Methods		Turn-around Time in Days
PLM	EPA 600/R-93/116	3-5
PLM-Point Count	EPA 600/R-93/116	3-5
Total Lead (mg/Kg)	EPA 6010	6-10
TCLP lead (mg/l)	EPA 1311/6010	10

NOTE: Report Friability of asbestos in PLM REPORT – on column "Description" By NF = nonfriable and F = friable

Date	Field Sample No./Description	Matrix								
1/5/2000	90049-A14 Flashing around vent	Solid							X	
1/5/2000	90049-A15 Window Caulking	Solid							X	
1/5/2000	90049-A16 Window Caulking	Solid							X	
1/5/2000	90049-A17 Window Caulking	Solid							X	
1/5/2000	90049-A18 Pipe Insulation/canvaswrap	Solid							X	
1/5/2000	90049-A19 Flex connector	Solid							X	
1/5/2000	90049-A20 Flex connector	Solid						X		
1/5/2000	90049-A21 Plaster wall	Solid								

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